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ABSTRACT

This document consists of course materials for adult participants in a graduate-level course in "Survey of Human Resource Development." Following an introductory section on training materials, including a course pretest, and an introduction to graduate study, the course covers the following topics: (1) history of training; (2) behavioral sciences in training and development; (3) organization and management of training; (4) selection and development of the training staff; (5) determining training needs; (6) the performance audit; (7) workforce planning; (8) instructional systems; (9) using external resources; (10) training costs and benefits; and (11) legal aspects of training. Three appendixes contain answers to the course pre-test, progress tests, and the course final exam. Course materials include information sheets, activities, tips and suggestions, outlines, multiple-choice tests, glossaries, and charts and tables. (KC)

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ED 434 208

Survey of
Human Resource Development

PARTICIPANT HANDBOOK

The University of Tennessee
Department of Human Resource Development

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CONTENTS

		Page
Introductions		1
Course Pre-test[1]		2
Course Outline/Syllabus		5
Course Deliverables	Assignment Sheet	10
The Value of Films and Video Tapes	Information Sheet	12
Audiovisual Media Evaluation Form	Assignment Sheet	13
Video Tapes	Information Sheet	14
Prepare Duplicated Documents	Learning Objective Worksheet	17
Upgrade Course Glossary	Learning Objective Worksheet	18
Glossary	Information Sheet	19
Write a Scholarly Paper	Learning Objective Worksheet	37
Tips for Successful Writing	Information Sheet	38
History of Training	**Progress Test No. 1**[2]	40
Traditional Beliefs Based on Wisdom and Common Sense	Information Sheet	41
Contemporary Learning Theories	Information Sheet	42
Highlights of Early Unionism in the U.S.A.	Information Sheet	44
Behavioral Sciences in Training and Development	**Progress Test No. 2**[2]	49
Scientific Management	Information Sheet	50
Peer Training and Teamwork	Information Sheet	53
Effective and Ineffective Teams	Information Sheet	60

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[1] Answers to the pre-test are provided in Appendix A.

[2] Answers to all progress tests are provided in Appendix B.

Page

Scheduling Worksheets — Examples . . . . Information Sheets 62

Team Member — Rating, Evaluation, and Ranking Forms . . . . Assignment Sheets 64

Organization and Management of Training . . . . Progress Test No. 3[2] 67

Workplace Goals that Justify Investing Private Resources in Training . . . . Information Sheet 68

Workforce Training . . . . Information Sheet 70

The Impact of a Training Experience . . . . Information Sheet 74

Training Organization Charts . . . . Information Sheets 75

Training Policy Analysis . . . . Information Sheet 77

Selection and Development of the Training Staff . . . . Progress Test No. 4[2] 92

Competency Analysis for Trainers . . . . Information Sheet 93

Determining the Demand for Skilled Workers . . . . . Module 103

Satisfaction Rating Instrument (Module) . . . . Assignment Sheet 152

Labor Market Demand . . . . Assignment Sheet 153

Determining Training Needs . . . . Progress Test No. 5[2] 154

Needs Assessment: A Rationale and Methodology . . . . Information Sheet 155

The Performance Audit . . . . Progress Test No. 6[2] 177

Workforce Planning . . . . Progress Test No. 7[2] 178

Instructional Systems . . . . Progress Test No. 8[2] 179

Instructional Systems Development for Accountability . . . . Information Sheet 180

Using External Resources . . . . Progress Test No. 9[2] 187

The Self-Paced Learning Environment . . . . Information Sheet 188

---

[2] Answers to all progress tests are provided in Appendix B.

		Page
Individualization of Instruction	Information Sheet	191
Programmed Instruction	Information Sheet	216
Research on Preparing Self-Instructional Materials	Information Sheet	225
Training Costs & Benefits	**Progress Test No. 10**[2]	231
Determining the Cost Effectiveness of Training	Module	232
An Accounting Framework for Investments in Human Resource Development	Information Sheet	294
Legal Aspects of Training	**Progress Test No. 11**[2]	297
Checklist for Presentation Skills	Job Performance Aid	298
Course Final Exam[3] (Post-test)		300
Course Final Exam (Essay Test)		307

APPENDIX A: Course Pre-test Answers ... 308
APPENDIX B: Progress Test Answers ... 309
APPENDIX C: Course Final Exam (Post-test) Answers ... 310

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[2] Answers to all progress tests are provided in Appendix B.

[3] Answers to the final exam (post-test) are provided in Appendix C.

INTRODUCTIONS

In any college course, one of the most difficult, yet important, steps is to become acquainted with the instructor and other participants. To make the process of introducing yourself a little easier, consider the following statements. There is space for you to jot down some thoughts and ideas. It's fair to look at this later when you are addressing the group.

1. Who am I? (name, etc.) ______________________________

2. What I like most about my job is: ______________________________

____

____

3. What motivates me is: ______________________________

____

____

SS# ____________________ Date ____________________

Human Resource Development Department

The University of Tennessee
Pre-test

Directions: Each of the following items contains four (4) alternatives, one of which provides the best answer to the item. Circle the letter which precedes the best answer.

1. The program to train shipyard workers during World War I was based on the principle of

   A. classroom training separated from the worksite.
   B. avoiding the use of work supervisors as trainers.
   C. traditional long-term apprenticeship training.
   D. show, tell, do and check.

2. A manager can conclude that a formal training program will be useful when

   A. problems exist that can be partly or wholly solved by giving personnel identifiable items of knowledge, skill or attitude.
   B. individuals or groups of workers are not performing well enough to meet job standards set for them.
   C. the organization is not meeting the objectives included in annual or long-term plans.
   D. some or all jobs in the organization require specific knowledge and skill for successful performance.

3. The most important function of a basic training policy is to

   A. describe the specific training programs that will be carried out.
   B. show how training will be used to help achieve the goals of the organization.
   C. enumerate the problems that have resulted in the establishment of a training program.
   D. demonstrate to top management that a training program is necessary.

4. A recommended procedure for achieving cost-effective training programs is to

   A. determine the absolute minimum training needs and design low-cost programs to meet these.
   B. design and estimate costs for an optimum program and compare alternatives with this.
   C. always use the lowest-cost training method available.
   D. concentrate on training costs since benefits cannot be measured in financial terms.

5. Why might a training manager choose a rental-deferred purchase plan to buy an expensive videotape machine?

   A. Rental-purchase plans are almost always less expensive than outright purchase.
   B. The plan might allow the purchase to be included in the operating budget rather than in a tight capital budget.
   C. The plan would always place the purchase in the capital budget rather than in the operating budget.
   D. Such purchases need not be charged to the costs of training.

6. One of the most important findings of the Hawthorne studies for Western Electric was the conclusion that

   A. physical and environmental influences have little effect on worker efficiency.
   B. experimental methods are of little value in improving work effectiveness.
   C. social interactions and group influences may have a stronger effect on work efficiency than physical factors in the environment.
   D. the best incentive for increased productivity is higher wages.

7. Abraham H. Maslow's hierarchy of needs would predict that a worker whose physiological, safety, belonging and love needs were satisfied would be motivated

   A. largely by the incentive of salary increases.
   B. by chances to satisfy esteem and self-actualization needs.
   C. by further chances to satisfy physiological, safety, belonging and love needs.
   D. only by the fear of punishment or loss of reward.

8. According to Frederick Herzberg's two factor theory, which of the following lists include job factors that are likely to be strong motivators and sources of satisfaction?

   A. achievement, responsibility and the work itself.
   B. working conditions and salary.
   C. status and job security.
   D. interpersonal relations and supervision.

9. The Managerial Grid was developed by Robert R. Blake and Jane S. Mouton to help demonstrate that

   A. managers concentrate too much on production and do not show enough concern for people.
   B. organizational development should rely on graphic methods.
   C. people and production are complementary and mutually reinforcing in reaching goals.
   D. if managers concentrate on the people in an organization, production goals will take care of themselves.

10. Well-planned training facilities directly affect the success of training programs by

   A. reducing the need for visual display material.
   B. facilitating successful lectures.
   C. making up for deficiencies in the instructional materials.
   D. creating the kinds of attitudes that contribute to learning.

11. Training that is conducted outside the employee's normal work hours, attended voluntarily, not directly related to the employee's job, and in which the employee does no production work is

   A. normally not compensable time and does not contribute to the hours in a standard workday or workweek.
   B. by law always subject to overtime pay.
   C. specifically included in federal wage and hour legislation as compensable time.
   D. not allowed for firms working on federal contracts.

12. Which of the following would most likely qualify as true apprenticeship training eligible for government guidance and assistance?

    A. A one-year work/study program to train clerk-typists.
    B. An on-the-job sales training program with no classroom instruction.
    C. A work experience training program to help 14- to 16-year-old migrants learn to do farm work.
    D. A three-year program combining classroom instruction and on-the-job experience to train bricklayers.

13. The Equal Employment Opportunity Commission's guidelines for selecting job candidates

    A. prohibit the use of employee selection tests.
    B. view all pencil-and-paper tests as being fairer than other selection methods.
    C. do not provide guidance in the use of employment selection tests.
    D. allow the use of selection tests if the tests have been properly validated.

14. The presentation portion of the lesson plan format

    A. lets the learners practice what they have observed.
    B. demonstrates the skills to be learned.
    C. measures the achievement of the learner.
    D. should sustain the attention of the learner.

15. The National Labor Relations Act became law

    A. during World War II.
    B. just after the Depression.
    C. during the Korean War.
    D. during the Vietnam War.

16. When interviewing for a needs assessment, you should

    A. use a variety of questions.
    B. set no time limit.
    C. try to avoid taking notes during the interview.
    D. know something about the worker being interviewed.

Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Knoxville, Tennessee

COURSE OUTLINE/SYLLABUS

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1. Course Description: (from Graduate Catalog)

Training and development as practiced in organizations: needs assessment, transfer of workplace skills, evaluation, development of training program proposals, assessment of personal competencies, values, goals, and training program design and administration.

2. Anticipated Participants:

This course is designed for individuals in (or preparing for) all levels of the training and performance improvement community who are responsible for developing, implementing, teaching, evaluating, or managing educational/training courses and programs related to successful job performance and career mobility.

3. Course Objectives:

3.1 Help the participant become a more skillful, confident, and resourceful trainer
3.2 Review and clarify strategies for meeting training and development needs
3.3 Discuss the role and function of a trainer
- Guiding a group of specialists
- Goals and objectives for the training department
- Training costs and benefits
- Making the training department important to management

3.4 Provide some practical understanding of selected topics from item 4
3.5 Initiate a selected reading program

4. Subject Matter Topics:

4.1	How to: Read/Write/Make a Speech/Use a Library	Information Sheets
4.2	The Value of Films and Video Tapes	Information Sheet
4.3	Audiovisual Media Evaluation Form	Assignment Sheet
4.4	Tips for Successful Writing	Information Sheet
4.5	**History of Training**	**Progress test No. 1**
4.6	Traditional Beliefs Based on Wisdom and Common Sense	Information Sheet
4.7	Lesson Plan Format	Information Sheet
4.8	**Behavioral Sciences in Training and Development**	**Progress test No. 2**
4.9	Scientific Management	Information Sheet
4.10	Peer Training and Teamwork	Information Sheet
4.11	Effective and Ineffective Teams	Information Sheet

4.12	Example of a Scheduling Work Sheet	Information Sheet
4.13	Team Member — Rating, Evaluation, and Ranking Forms	Assignment Sheets
4.14	**Organization and Management of Training**	**Progress test No. 3**
4.15	Workplace Goals that Justify Investing Private Resources in Training	Information Sheet
4.16	Workforce Training	Information Sheet
4.17	The Impact of a Training Experience	Information Sheet
4.18	Training Organization Charts	Information Sheet
4.19	Training Policy Analysis	Information Sheet
4.20	**Selection and Development of the Training Staff**	**Progress test No. 4**
4.21	Competency Analysis for Trainers	Information Sheet
4.22	Determining the Demand for Skilled Workers	Module
4.23	Labor Market Demand	Assignment Sheet
4.24	**Determining Training Needs**	**Progress test No. 5**
4.25	Needs Assessment	Information Sheet
4.26	Needs Assessment: A Rationale and Methodology	Information Sheet
4.27	**The Performance Audit**	**Progress test No. 6**
4.28	**Workforce Planning**	**Progress test No. 7**
4.29	**Instructional Systems**	**Progress test No. 8**
4.30	**Using External Resources**	**Progress test No. 9**
4.31	The Self-Paced Learning Environment	Information Sheet
4.32	Individualization of Instruction	Information Sheet
4.33	Programmed Instruction	Information Sheet
4.34	Research on Preparing Self-Instructional Materials	Information Sheet
4.35	A Point of View on Individualized Instruction	Information Sheet
4.36	**Training Costs and Benefits**	**Progress test No. 10**
4.37	Determining the Cost Effectiveness of Training	Module
4.38	An Accounting Framework for Investments in HRD	Information Sheet
4.39	**Legal Aspects of Training**	**Progress test No. 11**
4.40	Checklist for Presentation Skills	Job Performance Aid
4.41	Technology Transfer: Model Programs in Europe	Information Sheet

5. **Instructional Format:**

A blend of instructional strategies, including lecture-discussion, individual and group activities, self-learning modules, supplemental reading, video tapes, individual consultation, and written assignments will be utilized. Participants are expected to be active and, hopefully, enthusiastic as they work and share with others in the learning process. A strong accent is placed on fostering interaction to engage participants in pooling their abilities and experiences. Project assignments, and the combination of theory with practice, provide for full immersion in the subject matter to make training optimally effective. Prescriptive feedback, including suggestions for improvement, is provided on all course products submitted.

6. **Assignments:** (See Assignment Sheet No. 1, titled **COURSE DELIVERABLES,** for details)

Paper and pencil tests (pre-test and post-test including essay items) as well as course activities and products (deliverables) are used in determining final grades. All products shall be prepared and submitted in accordance with requirements and instructional materials used in the course. Products will be critiqued, graded, and returned to the developer(s).

Course participants shall:

6.1 Preview audiovisual media dealing with training and submit evaluation forms.

6.2 Submit duplicated documents: clippings, reprints, or photo copies of carefully selected relevant text. Submittals are to be made during the first part of the course term so that selected items can be shared with the class through "mini-briefs."

6.3 Attend a meeting dealing with training or a closely related topic and submit a one-page typed report.

6.4 Identify and describe the salient characteristics of two labor market signaling approaches.

6.5 Write a scholarly paper. Select subject/topic from list on Assignment Sheet No. 1 and follow the APA Publication Manual (4th edition).

6.6 Upgrade the course glossary by (a) making beneficial changes to existing entries on course glossary and glossary of terms in textbook, and (b) adding new words and terms relevant to the course. Credit sources of changes and additions.

7. **Understanding Grading Practices:**

Grading constitutes a complex and difficult process. While human beings cannot be pigeonholed, they can be judged on the basis of their performance. The following descriptive profiles attempt to explain why different participants obtain different final grades.

The "A" Grade — Superior Performance: Traditionally, this highest grade represents some form of extra effort and superior performance.

"A" participants are punctual and present for the entire class period. They have virtually perfect **attendance**. Their commitment to the course resembles that of the instructor.

"A" participants are **prepared for class**. They always read, thoroughly and critically, the instructional materials. Their attention to detail is such that they submit all work on time and occasionally submit suggestions for improvements to the instructional materials being used.

"A" participants **show interest in the class and in the subject**. They take responsibility for their own learning and look up or dig out what they don't understand. They participate in class, asking relevant questions and making thoughtful comments.

"A" participants bring a background with them to class and **share relevant experiences** with others.

"A" participants have **retentive minds**. They are able to connect past learning with the present. They apply facts, principles, techniques, theories, concepts, and procedures previously learned to new learning situations.

"A" participants have a **winning attitude**. They have both the determination and the self-discipline necessary for success. They show initiative, doing things they have not been told to do and going the "extra mile" to ensure success.

"A" participants have something special. It may be exceptional intelligence and insight. It may be unusual creativity, organizational skills, commitment, perseverance — or a combination thereof. These gifts are evident to the instructor and to the other participants as well.

"A" participants **make high grades** on examinations and course submittals.

The "C" Grade — Performance Below the Standard Expected of Graduate Students

"C" participants miss class, arrive late, and/or leave early. They put other priorities ahead of academic work. In some cases, their health or fatigue renders them physically unable to keep up with the demands of high-level graduate performance.

"C" participants prepare their assignments, but in a perfunctory manner. Their work may be sloppy or careless. There is little or no evidence that quality control checks were made before an assignment was submitted. At times, submittals are incomplete and/or late.

"C" participants are not visibly committed to the class. They participate without enthusiasm. Their body language often expresses boredom or worse.

"C" participants vary in talent. Some are academically talented but show undeniable signs of poor self-management or bad attitudes. Others are diligent but simply average in academic ability.

"C" participants obtain mediocre or inconsistent results on course submittals. They have some concept of what is going on but clearly have not mastered the material or method.

Note. These descriptive profiles were adapted from "Clarifying Grade Expectations" by J. H. Williams, 1993, The Teaching Professor, August/September, p. 1.

8. **References:**

8.1 Campbell, C. P. (1997, February). Determining the demand for skilled workers.[2]
8.2 Campbell, C. P. (Ed.). (1996). Education and training for work: Planning programs. Lancaster, PA: Technomic.[1]
8.3 Campbell, C. P. (1994, March). Determining the cost effectiveness of training.[2]

Footnotes

[1] Course textbook, available from UT bookstore and the publisher. (The author/instructor receives no royalties (profit) from the sale of this work.)

[2] Module, available from the Human Resource Development Department, The University of Tennessee, Knoxville, TN 37996-1900

9. **Notes:**

9.1 In the event that some unforeseen event or circumstance occurs, during the course term, that adversely affects your performance, e.g., a death in the family or personal illness, please advise the instructor in writing so that proper consideration can be given.

9.2 The language of instruction is the American form of English.

9.3 In post-secondary settings, it is the student's responsibility to request an accommodation for a documented disability. Students with a disability, according to the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, should feel free to contact the Office of Disability Services, 191 Hoskins Library, 974-6087, for assistance.

9.4 In response to previous student concerns, and as a matter of courtesy, portable electronic communication devices with audible signals are to be deactivated (turned off) during class.

9.5 Slipshod and untidy work is not acceptable. Don't let the quality and completeness of any submittal fall below your personal standards or those of the course. Details receive close attention. A quality control (QC) check by you and others is recommended before every course submittal.

Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Assignment Sheet No. 1

COURSE DELIVERABLES

Charge: To share expertise, knowledge and learning acquired in a selected subject/topic.

Activity 1. **Audiovisual media**

Preview **three (3)** films/video tapes/video disks/sound slide programs/filmstrips/audio tapes **dealing with training principles, issues, methodologies, techniques,** etc., and submit typed audiovisual media evaluation forms. Turn in one (1) evaluation by class session four and the other two (2) not later than class session eight.

Submittals are rated with a (✓+), (✓), or (✓-). A (✓+) is the highest rating and (✓-) the lowest. A quality control check of each audiovisual media evaluation form is recommended before its submittal.

Activity 2. **Duplicated documents**

Submit **four (4)** different duplicated documents, clippings, reprints or photo copies of text discussing any of the subjects/topics listed on the next page (Page 2 of 2). Turn in one (1) document by class session three and the other three (3) at **regular intervals during the first seven sessions** of the course term so that selected items can be shared with the class through "mini-briefs."

Each submittal needs to be **carefully selected** from a book, journal, magazine, etc. for its **quality** and **relevance to a particular subject/topic**. Focus on applications/information dealing with print "hard copy" vice audiovisual media or methods. Show your comprehension of the content by **highlighting the text that is important to the subject/topic identified**.

Submittals **shall include** (a) the source reference in accordance with the Publication Manual of the American Psychological Association (APA), fourth edition; (b) the appropriate subject/topic and its number from the list on Page 2 of 2; and (c) your name and social security number (last 4 numbers only). Use a cover page of your own design to provide this information.

A judgment will be made concerning the (a) **care exhibited in selecting the document**, (b) **relevance and quality**, (c) **comprehension shown through selected highlighting**, as well as (d) **accuracy of the source reference**, and (e) **completeness of each submittal**. Submittals are rated with a (✓+), (✓), or (✓-). A (✓+) is the highest rating and (✓-) the lowest. Note: Slipshod and untidy work is not acceptable. A quality control check is recommended before submitting documents.

Activity 3. **Meeting**

Attend a meeting dealing with training or personal matters and submit a one-page typed report (in accordance with the APA publication manual) by class session 12. Meetings of the Smoky Mountain Chapter, American Society for Training and Development are excellent for satisfying this activity.

Activity 4. **Labor market signaling**	Identify and describe the salient characteristics of any two (2) of the five labor market signaling approaches. Include a table showing their advantages and disadvantages. See assignment sheet titled **COURSE DELIVERABLE — LABOR MARKET DEMAND** for complete details.
Activity 5. **Paper**	Write a scholarly paper, approximately six double-spaced typewritten pages in length on any of the subjects/topics listed on Page 2 of 2. It is to be a **derivative work** (based on preexisting works) prepared in accordance with the APA Manual. The paper shall include a (a) minimum of one figure or table and (b) reference list. Don't forget to use headings, mention Figures and/or Tables in your text, and document your work by citing sources. Staple pages in top left corner — do not use a binder or plastic page protectors. The paper is due **not later than** class session 13.
Activity 6. **Glossary**	Upgrade the course glossary by (a) making beneficial changes to existing entries on course glossary and glossary of terms in textbook and (b) adding new words and terms relevant to the course. Credit sources of changes and additions.

Subjects/Topics: The subject/topic for activities 2 and 5 should be selected from the following list. Any of these topics or a sub-division of the topic may be chosen for activity 5 without instructor approval. If an alternate topic is preferred, a brief written proposal must be submitted to the instructor for approval prior to any writing effort. Focus on applications/information dealing with print "hard copy" vice audiovisual media or methods.

1. Labor Market Skill Requirements and Training Output
2. Needs Analysis/Assessment
3. Job and/or Task Analysis
4. Non-formal Vocational Education and Training
5. Job Performance Measures (Criterion-Referenced Performance Tests)
6. The Costs and Benefits of Training
7. Training Program Evaluation (Internal and/or External)
8. Training and Follow-up Activities (How to Combat Training Failure Which Occurs When the Training Experience Is Not Applied to the Work Situation)
9. The Hawthorne Studies
10. Scientific Management (Frederick Winslow Taylor)
11. The Need for and Purposes of Licensing and Certification

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Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Information Sheet

THE VALUE OF FILMS AND VIDEO TAPES

More and more trainers are recognizing the value of audiovisual media. As a result, they are using films and video tapes to a greater degree in their courses and programs. Studies show that a film or video tape can make just about any subject matter **25% more understandable**. In comparison to print materials, it was estimated that a well-made video tape can **increase interest in a topic by as much as 40%**. Furthermore, researchers found that persons viewing films and video tapes **retain approximately 33% more information** for as long as 1 year after the viewing.

The Chinese proverb, "To see a thing once is better than to hear it a hundred times," emphasizes the inadequacy of using only words in communication. People have multiple sensory abilities. They can see, feel, taste, smell, and hear. We know that training techniques which stimulate as many of these senses as possible enhance learning and strengthen retention.

Films and video tapes combine two powerful senses — sight and hearing — and support training/learning in ways such as the following:

1. Difficult concepts can be presented on a practical level in a short period of time.

2. Because sound and picture are presented simultaneously, attention can be focused on the critical elements of a mechanical process or a human interaction.

3. Because people are involved, viewers often relate directly to the situations depicted and see ready applications for the information presented.

4. They help avoid boredom inherent in lessons which depend on a single instructional technique.

5. They provide a means for the storage and prompt retrieval of important information that can be shared with many individuals or groups in exactly the same way.

6. They set the stage for role play, case study, discussion, and other learning opportunities.

7. Audio can be provided in various languages and volume can be adjusted for those with a hearing problem.

Nevertheless, the matters of cost/availability, hardware requirements, outdated clothing, hairstyles, vocabulary, content, etc. can be disadvantages.

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AUDIOVISUAL MEDIA EVALUATION FORM

REVIEWER ______________________ DATE ______________________

REVIEWED FOR ______________________

TITLE ______________________

SUBJECT MATTER ______________________

PRODUCER/DISTRIBUTOR ______________________

DATE PRODUCED ______________________ LENGTH (TIME) ______________________

RECOMMENDED AGE LEVEL ______________________

☐ AUDIO ☐ SLIDES ☐ FILM ☐ FILMSTRIP ☐ VIDEOTAPE / ☐ COLOR ☐ B & W

RATING

	Poor		Average		Excellent	
A. QUALITY						
1. Sound quality (audibility/voice/music)	0	1	2	3	4	5
2. Picture quality (clarity/color)	0	1	2	3	4	5
3. Narration/acting	0	1	2	3	4	5
B. CONTENT AND ORGANIZATION						
1. Content is current	0	1	2	3	4	5
2. Vocabulary & concepts are appropriate	0	1	2	3	4	5
3. Organized/logically presented	0	1	2	3	4	5
4. Provides interest/appeal	0	1	2	3	4	5
5. Content accurate	0	1	2	3	4	5

SYNOPSIS OF CONTENT

(Continue on back of sheet if necessary)

ESTIMATE OF OVERALL VALUE OF THE MEDIA

POOR		AVERAGE			EXCELLENT
0	1	2	3	4	5

VIDEO TAPES

Beyond Theory Y		14 min.
Business Behaviorism and the Bottom Line		20 min
Collision Course		48 min.
Communicating Non-Defensively: Don't Take It Personally		21 min.
Conflict on the Line, A Case Study		15 min.
Crisis Bargaining		35 min.
Dealing With Difficult People		20 min.
Discipline Without Punishment		20 min.
Doing Business Internationally: The Cross-Cultural Challenges		45 min.
Effective Uses of Power and Authority		32 min.
Everyone Can Be A Winner "Team Building"		22 min.
Fair Employment Practice		Part I, 27 min. Part II, 14 min. Part III, 30 min.
First Line Supervisor		Module 5
Group Dynamics, Groupthink		27 min.
Guide to Business Negotiating	Roger Dawson	70 min.
How To Be A No Limit Person	Dr. Wayne Dyer	57 min.
If Japan Can . . . Why Can't we?		77 min.
In Search of Excellence		88 min.

Introduction to Supervision, Supervision Series		
Job Orientation — The Supervisor's Role in Training New Employees		18 min.
Megatrends		
Modern Times: Effects of Production Line on Workers	Charles Chaplin	87 min.
A New Look At Motivation		32 min.
The One Minute Manager		50 min.
The Principles and Practices of MBO		
Problem Solving: A Process for Managers		20 min.
Productivity and the Self-fulfilling Prophesy: The Pygmalion Effect		29 min.
The Self-motivated Achiever		30 min.
Strategy for Productive Behavior		30 min.
Team Building		30 min.
Team Building (2nd Edition)		19 min.
Team Building: Making the Task the Boss		18 min.
Teamworking		13 min.
Theory X and Theory Y: The World of Douglas McGregor		Part I, 30 min. Part II, 30 min.
Time of Your Life		27 min.
Time Management System		
Type Z: An Alternative Management Style		Part I, 50 min. Part II, 50 min.
Up the Organization		26 min.

W. Edwards Deming Lecture		Part I, 78 min. Part II, 78 min.
The Winner's Attitude	Zig Ziglar	41 min.
Working Together Works		28 min.
Working with Difficult People		25 min.

"Frederick Taylor and Scientific Management"
Approximately $475 purchase, $150 rental

Distributed by
Salenger Films, Inc.
1635 12th Street
Santa Monica, CA 90404
Phone (800) 775-5025
(310) 450-1300,
Fax (310) 450-1010

"Clockwork" [motion picture]
Producer/Director, Eric Breibert
1 film reel (25 min.), 16mm, 1982
Approximately $450 purchase, $50 rental

Distributed by
California Newsreel
149 Ninth Street, Suite 420
San Francisco, CA 94103
Phone (415) 621-6196
Fax (415) 621-6522

Summary: Through archival and contemporary documentary footage, studies the role of Frederick Winslow Taylor in the development of scientific management in the early twentieth century. Explains the techniques Taylor used to study worker movements and the methods he conceived to divide complex jobs into smaller, unskilled routines.

LEARNING OBJECTIVE WORKSHEET

PROGRAM/COURSE TITLE:	TASK NO: N/A	UNIT/BLOCK OF INSTRUCTION: **Individual project**

FILL OUT ONE SECTION ONLY	☐ TERMINAL	TERMINAL OBJECTIVE NO:	ENABLING OBJECTIVE NUMBERS SUPPORTIVE:
	☐ ENABLING	ENABLING OBJECTIVE NO: .	TERMINAL OBJECTIVE NUMBER SUPPORTED:

BEHAVIORAL ACTION STATEMENT:

Prepare duplicated documents

PERFORMANCE CONDITION(S):

1. From books, journals, magazines, etc.
2. Using a photocopier
3. Using a stapler
4. Using a yellow highlighter
5. Using a PC or typewriter
6. Given a copy of assignment sheet number 1, containing a list of subjects/topics
7. Using a personal copy of the APA Publication Manual, 4th edition

ATTAINMENT STANDARD(S):

1. Submit a minimum of four (4) different duplicated documents
2. Submitted at regular intervals during first 7 class sessions
3. Carefully selected for quality & relevance to a particular subject/topic taken from list on assignment sheet no. 1
4. Points important to subject/topic identified are highlighted
5. Submittals to include on a cover page: (a) source reference in accordance with APA, 4th edition; (b) name, SSN — last four; & (c) appropriate subject/topic, & its number
6. Each submittal to be complete
7. Tidy work
8. Free from errors in spelling, grammar, & punctuation
9. Prepared with assistance as necessary
10. Submitted on _______________________

TEST ITEMS:

BEST COPY AVAILABLE

LEARNING OBJECTIVE WORKSHEET

PROGRAM/COURSE TITLE:		TASK NO: N/A	UNIT/BLOCK OF INSTRUCTION:
FILL OUT ONE SECTION ONLY	☐ TERMINAL	TERMINAL OBJECTIVE NO:	ENABLING OBJECTIVE NUMBERS SUPPORTIVE:
	☐ ENABLING	ENABLING OBJECTIVE NO:	TERMINAL OBJECTIVE NUMBER SUPPORTED:

BEHAVIORAL ACTION STATEMENT:

Upgrade course glossary

PERFORMANCE CONDITION(S):

1. Using a personal copy of the APA Publication Manual, 4th Edition
2. Given course glossary and glossary of terms in textbook
3. Using relevant sources — books, journals, magazines, etc.
4. Using a PC or typewriter
5. Using a stapler

ATTAINMENT STANDARD(S):

1. Make beneficial changes to entries on course glossary
2. Add new words and terms relevant to course
3. Credit sources of new words and terms as well as beneficial changes, within text, in accordance with APA paragraphs 3.34 - 3.40 (pp. 95-98) and 3.101 - 3.102 (pp. 173-174)
4. All references cited in text appear in the reference list in accordance with APA paragraphs 3.104 - 3.117 and Appendix 3-A, pp. 189-222
5. Submit neat materials, free from errors in spelling, grammar, & punctuation
6. Submit with cover page including name, last four social security numbers, & course name & number
7. Submit on ________________________

TEST ITEMS:

C^{2}99

Glossary

The clear definition of terminology enhances communication. Therefore, the following keywords, terms, and phrases are defined for use throughout this document.

ABILITY

Power to do something; the result of learning and practice. A characteristic indicative of an individual's skill, expertness, or competence.

ACCOUNTABILITY

Responsibility for the commitment of resources in terms of program results or outcomes. This accounting involves both the stewardship of resources and the evaluation of achievements in relation to specified objectives.

ACHIEVEMENT

What a person knows or can do after training.

ACHIEVEMENT TEST

An instrument that measures the current status of an individual's proficiency in given knowledge or skills.

ALIGNMENT

The linking (aligning) of performance development and measurement to organizational goals and objectives.

APPLIED RESEARCH

Research conducted for the purpose of applying or testing theory and evaluating its usefulness in solving problems.

APTITUDE

The natural ability or inclination to acquire knowledge and skills or to show potential for success in skills or an occupation when given training.

ASSESSMENT

The act of determining the significance, value, or amount of learning.

ASSUMPTION

Important fact(s) presumed to be true but not actually verified; assumptions should be described in the procedures section of a research plan and report.

ATTITUDE

A feeling or emotion that influences an individual's responses. A disposition or tendency to respond positively or negatively toward a specific activity, event, idea, object, person, situation, thing, etc.

BARRIERS TO TRANSFER

Actual and perceived factors that act as impediments to transfer of training to the workplace.

BASELINE

Valid and reliable information and data about the intended trainee population, used to ascertain differences between performance before and after instruction.

BEHAVIOR

An individual's [visible, audible] action, performance, or product which can be measured by an observer according to specific and discrete criteria.

BENCHMARKING

A systematic approach for measuring and comparing the processes and products of one organization to those of another, which is considered to have the best practices (benchmarks), for the purpose of identifying practices in the first organization that can be improved.

BIAS

A mental leaning, partiality, or inclination. Bias in measurement occurs when characteristics of the measures, the process, or interpretation of the results leads to inaccurate inferences about the knowledge, skills, or other attributes of an individual or a group. Sample bias results from the omission or the unequal selection of members of the population without appropriate weighting.

CENSUS SURVEY

Descriptive study that attempts to acquire data from every member of a population.

COMPARATIVE EVALUATIONS

Evaluations that assess the effectiveness of a program by comparing it with an alternate program designed and developed to accomplish the same results.

COMPETENCY

A cluster of related knowledge, skills, and attitudes that affect one's job, that correlates with performance on the job, that can be measured against accepted standards, and that can be improved through training and development.

CONTENT VALIDITY

An assessment that attests that a product will produce the desired results. A comparison of learning objectives, instructional materials, and criterion tests to ensure that they track with one another and may be expected to produce the desired outcomes.

CONTROL GROUP

A group, similar on as many variables as possible, to the one that participated in the training being evaluated, but which was treated as usual (did not receive the training).

CORRELATIONAL RESEARCH

Collection and analysis of data in order to determine whether, and to what degree, a relationship exists between two or more quantifiable variables.

COST-BENEFIT ANALYSIS

An assessment of the specific costs and benefits (expressed in economic terms) involved with training. An analytic approach to making decisions. Requires the definition of objectives and identification of alternative way(s) of reaching each objective. A comparison can then be made by looking at the identification, for every objective, of the alternative(s) and seeing which results in the greatest benefit for a given cost or produces the expected level of benefits at the lowest cost.

COST EFFECTIVENESS

A comparative evaluation derived from an analysis of two or more alternatives (actions, methods, approaches, equipment, support systems, etc.) in terms of the interrelated influences of cost and effectiveness in accomplishing a learning objective.

COVERT BEHAVIOR

Mental activity that is not directly observable; usually referred to as thinking.

CRITERION (CRITERIA)

The standard, rule, or test against which things, including learning, are measured and/or judged.

CRITERION-REFERENCED PERFORMANCE TEST (CRPT)

A sample work situation in which individuals perform a task which requires them to demonstrate that they have acquired the necessary knowledge and skills. Individual performance is compared to set attainment standards derived from a task analysis. Also called a Job Performance Measure.

CRITERION-RELATED VALIDITY

Validity determined by relating performance on a test to performance on another criterion.

DATA

Numerical values, gathered by using instruments (e.g., a questionnaire), from which conclusions can be drawn.

DEFICIENCY

Failure of an individual or group to meet a standard set of requirements.

DEPENDENT VARIABLE

The change or difference in behavior that occurs as a result of an independent variable; also referred to as the criterion variable, the effect, outcome, or post-test.

EFFECTIVENESS

Evaluation criteria based on how well training accomplishes what was intended — attainment of learning objective(s). Extent to which training outcomes match training or organizational goals. How well someone or something is performing compared to expectations.

EFFICIENCY

Resource control; doing more or the same for less money, time, etc.; reducing or containing costs. Also, reducing the inefficiencies of learning. Evaluation at the efficiency level is process-oriented and formative in nature.

ENTERPRISE

A business, company, commercial or industrial establishment, firm, or organization that employs workers.

ENTRY TEST

A test on learning objectives that the intended trainee must have attained in order to begin the training.

EVALUATION

The process of collecting information/data using tests, CRPTs, etc. and interpreting it in order to make decisions/judgments (as to whether training produced the desired effect/results).

EVALUATION INSTRUMENTS

Tests, rating forms, checklists, reaction forms/opinionnaires, questionnaires, interview guides/schedules, and other devices used to (a) gather information and data; (b) determine achievement; or (c) determine the relative standing of an individual, group, or objective (attitude, performance, etc.).

EVALUATION REPORT

A written report documenting the purposes, objectives, procedures, conclusions, and recommendations from a course or program evaluation. Used by stakeholders to improve training and learning.

EVALUATION SCHEMA

A carefully devised plan (in outline form) for evaluating training courses and programs. It shows the different parts and the actions involved.

EVIDENCE

The result of design, measurement, and analysis, and the reporting of data pertaining to features of the program and its effects.

EXTERNAL EVALUATION

The collection and analysis of feedback information/data from outside the instructional setting to (a) evaluate the graduates' job performance, and (b) determine whether the job requirements have changed.

EXTRANEOUS INFLUENCES

Factors affecting variables being measured, but which are not accounted for in the evaluation and which may have escaped the evaluator's awareness.

FEASIBILITY STUDY

An analysis conducted to establish the practicality and cost justification of a training course/program.

FEEDBACK

Information on performance is "fed" back to the (a) individual, in order to improve proficiency; (b) instructional designer, so that the materials and procedures can be improved on the basis of trainee needs; and (c) management system, so it can monitor the internal and external integrity of the instruction and make appropriate revisions.

CENSUS SURVEY

Descriptive study that attempts to acquire data from every member of a population.

FORMATIVE ASSESSMENT/EVALUATION

The process of collecting information and data on instructional materials, media, procedures, instruction, and tests, while they are being developed and tried out, in order to improve their relevance, effectiveness, and efficiency. The process begins during job analysis and continues through developmental testing.

FOLLOW-UP EVALUATION

Studies that examine the impact of training on job performance and the organization.

GAIN SCORES

The numerical difference between an individual's post-test and pre-test scores. The results are an estimate of training effectiveness (learning).

GO/NO-GO

Evaluation criterion whereby an individual is either 100% correct (go) or incorrect (no-go). Also called pass/fail.

GRADING

The process of assigning a mark or rating to trainee deliverables and examinations.

HALO EFFECT

The phenomenon whereby impressions concerning an individual (positive or negative) affect subsequent measurements of that individual's work.

IMPACT

Effects of learning on trainees' behavior and attitudes.

INSTRUCTIONAL MATERIALS

Tangible trainee-oriented resources, with instructional content. They facilitate the learning process and are an essential component of effective and efficient training courses and programs. Instructional materials can be categorized as (a) printed materials, (b) audiovisual media, and (c) manipulative aids.

INSTRUCTIONAL METHODS

Methods (strategies) of presentation, practice, and evaluation specifying the ways in which the desired learning outcomes are to be achieved in the instructional setting. Appropriate methods include lecture/discussion, demonstration, practical application, group or panel discussions, role playing, case studies, programmed instruction, and so forth.

INSTRUCTIONAL SETTING

The place/environment in which instruction is provided. For example, the (a) schoolhouse — classroom, shop, laboratory, library, etc.; and (b) workplace — factory, construction site, garage, supermarket, hospital, etc.

INSTRUCTOR

A person who instructs: teacher or trainer. One who directs the development of individuals by helping them gain proficiency in skills through instruction, coaching, or facilitation to accomplish learning objectives.

INSTRUMENTATION

Selecting or developing measuring devices and methods appropriate to a given evaluation problem.

INSTRUMENTATION ERROR

A built-in bias that causes an instrument to be inaccurate.

INSTRUMENTS

Questionnaires, interview guides/schedules, and opinionnaires or reaction forms used to gather information and data from respondents.

INTERNAL EVALUATION

The collection and analysis of feedback and management information/data from within the instructional setting to assess training effectiveness in terms of individual attainment of learning objectives.

ITEM

One question or statement on an instrument.

JOB

All the duties and tasks performed by a single job incumbent constitute that individual's job. If identical tasks are performed by several individuals, they all hold the same job. The job is the basic unit used in carrying out the personnel actions of recruitment, selection, training, classification, and assignment.

JOB ANALYSIS

The process used to identify the tasks and elements necessary to perform a clearly-defined, specific job. Often involves observations of workers and interviews with those who know the job, in order to describe completely and accurately the work performed and the requirements for successful performance.

KNOWLEDGE

Techniques, principles, facts, information, etc., that, although not directly observable, are required to develop the skills and attitudes to effectively accomplish prescribed tasks and jobs. Knowledge is acquired by investigation, observation, and interaction with the environment (experiences).

LEARNING

Changes in the behavior of an individual, as a result of study and experience, that are retained and used. The changes in behavior are referred to as learning outcomes — acquisition of knowledge, skills, or attitudes.

LEARNING OBJECTIVE

A statement that specifies measurable behavior (performance) that trainees will be required to exhibit after instruction. Properly prepared, it includes the (a) behavioral action (what the trainee does), (b) performance conditions (what the trainee is given), and (c) attainment standards (how well the trainee must perform the behavioral action). Also called a Performance, Behavioral, or Criterion Objective.

LEARNING TAXONOMY

Bloom's Hierarchy — the taxonomic classification of cognitive, affective, and psychomotor learning behaviors/domains.

LEVEL OF STATISTICAL SIGNIFICANCE

The probability that the research results have occurred by chance. Example: $p= .05$ means that the results will happen by chance only five times in a hundred (on the average).

LIKERT SCALE

Used to generate numerical values for qualitative questionnaire items, by using an attitude scale on which individuals rate the intensity of their agreement or disagreement with descriptors (e.g., strongly agree, agree, undecided, disagree, or strongly disagree).

LIMITATIONS

An aspect of a study which the researcher knows may negatively affect the results or generalizability of the results, but over which the researcher has no control.

NORM-REFERENCED MEASUREMENT

Determining (comparing) an individual's achievement in relation to others'.

OCCUPATION

A skilled worker's trade, craft, vocation, profession, or job.

OUTPUTS

Influences training had on the trainee; products of the training process.

OVERT BEHAVIOR

Observable and measurable behavior/performance.

PERFORMANCE AUDIT

A framework for examining human performance problems and a set of procedures for determining the worth of correcting the problem, finding the cause, and designing cost-effective solutions to the problem.

PERFORMANCE DEFICIENCY

Inability to perform job tasks to established standards.

PERFORMANCE EVALUATION

The process of collecting information and data, by observation, interview, etc., and analyzing it to determine the level of proficiency or success in task performance.

POST-TEST

A test administered after the completion of instruction to assess whether an individual attained the learning objective(s). Also called a Post-Check or Post-Assessment.

PREDICTIVE VALIDITY

The degree to which a test is able to predict how well an individual will do in a future situation.

PRE-TEST

A test administered prior to instruction to determine what the individual already knows and can do. It is used to (a) confirm individual qualifications for entering a program,

(b) identify remedial training requirements, and (c) identify enabling objectives/instruction the trainee can bypass. The results are saved for comparison with a post-test in order to determine the amount of learning which occurred. Also called a Pre-Check or Pre-Assessment.

PROFICIENCY

The ability to perform a specific behavior (task or learning objective) to the established standard in order to demonstrate mastery of the behavior.

PROGRESS TESTS

Examinations administered periodically (daily, weekly, etc.) throughout the training course or program to evaluate trainee progress.

QUALITY CONTROL

Process of measuring and evaluating in order to maintain course or program standards through adjustments in instructional materials, methods, or setting.

QUANTITATIVE

Relating to or expressible in terms of quantity, or involving the measurement of quantity or amount.

RANDOM SAMPLE

A portion of the target population in which there is a high degree of probability that it contains at least some target population characteristics. Sample selection is based on proven random sampling techniques.

RATING

A judgment about a trainee's knowledge, skills, or attitude.

REACTIONS

Opinions, feelings, and perspectives of trainees regarding an instructional experience.

RELIABILITY

The extent to which (a) a test measures achievement accurately on successive trials with similar trainees, and (b) an instrument produces the same results when used repeatedly by the same person or group.

SAMPLE

A number of individuals selected from a population for a study in such a way that they represent the larger group from which they were selected.

SATISFACTION

Degree to which an individual is pleased with a learning experience, e.g., whether personal needs were met.

SELF-EFFICACY

An individual's judgments of their capabilities to execute courses of action required to attain learning objectives and perform tasks on the job after training. It is concerned with judgments of what one can do with the skills possessed.

SELF-REPORT

Judgments made by trainees regarding their knowledge, skills, and attitude.

SIGNIFICANT

A real difference attributable to differences or relationships between two or more groups or individuals and not a difference due to chance alone.

SKILLS

Involve physical or manipulative activities. All skills are actions having special requirements for speed, accuracy, or coordination. They typically require knowledge, training, and practice for their proficient execution.

STAKEHOLDER

An individual who (a) has an interest in the course or program being evaluated, (b) needs the results, or (c) is affected by the process or recommendations.

STANDARDS

Describes the measurable criteria or standards of performance which must be attained. Included in learning objectives.

STRUCTURED INTERVIEW

A carefully planned interview using written questions and instructions specifying how to conduct the interview.

SUMMATIVE EVALUATION

An evaluation performed after training is completed in order to determine the "summed" (overall) effectiveness of a course or program.

SURVEY

An attempt to collect data from members of a population in order to determine the current status of that population with respect to one or more variables.

TASK

A distinct measurable work activity that constitutes specific and necessary action by a job incumbent for a meaningful purpose. It is the work unit that deals with the methods, procedures, and techniques by which parts of a job are carried out. Tasks vary in complexity but are made up of at least two elements. Related tasks are grouped together to make up a duty.

TEST

A device or technique used to measure an individual's knowledge, skill, or performance.

TRAINING

Preparing individuals with the practical know-how and theoretical insights, through applied learning experiences in a schoolhouse or at a workplace, necessary for gainful employment as skilled workers, technicians, or entry-level professionals. It imparts the knowledge, skills, attitudes, understandings, work habits, and appreciations needed to enter and progress in an occupation.

TRANSFER

The effective and continuing application, on the job or in other settings, of the knowledge, skills, and attitudes acquired in training. Transfer is determined by a follow-up evaluation after the completion of training.

VALIDATION

The process of developmental testing and revision of instruction until it is effective in realizing its intent.

VALIDITY

The extent to which (a) a test measures what it claims to measure, and (b) an instrument gathers the information and data it is designed (intended) to gather. Types of **instrument validity** include

- Content — the extent to which the test represents the program content (face validity)
- Construct — the extent to which the test represents the construct it purports to measure (attitude, skill, ability)
- Concurrent — the extent of agreement with another test
- Predictive — the extent to which future behavior can be predicted

VALUE

A function of the contribution that training makes to the organization. Determined by the extent to which there is a need for the contribution.

WORKPLACE

The enterprise in which graduates are employed to perform the skills trained.

WRITTEN TEST

A test in which individuals demonstrate their capabilities by written techniques. Not usually a performance test and, hence, generally a measure of supporting knowledge rather than skills.

Note. Some entries in this Glossary were adapted from Training Course/Program Evaluation: Principles and Practices (pp. 334-336), by C. P. Campbell, 1998, Bradford, West Yorkshire, England: MCB University Press.

LEARNING OBJECTIVE WORKSHEET

PROGRAM/COURSE TITLE:		TASK NO: **N/A**	UNIT/BLOCK OF INSTRUCTION: **Individual project**
FILL OUT ONE SECTION ONLY	☐ TERMINAL	TERMINAL OBJECTIVE NO:	ENABLING OBJECTIVE NUMBERS SUPPORTIVE:
	☐ ENABLING	ENABLING OBJECTIVE NO:	TERMINAL OBJECTIVE NUMBER SUPPORTED:

BEHAVIORAL ACTION STATEMENT:

Write a scholarly paper

PERFORMANCE CONDITION(S):

1. Using a personal copy of the APA Publication Manual, 4th Edition
2. Given a copy of Assignment Sheet No. 1
3. Using a PC or typewriter
4. Using a stapler

ATTAINMENT STANDARD(S):

1. Subject/topic of paper from list on Assignment Sheet No. 1
2. Scholarship format & style in conformance with criteria specified in APA Publication Manual, 4th Edition, including chapter 4
3. Used headings as an outline to reveal organization of paper
4. Free from errors in spelling, grammar, & punctuation
5. Used plain language; clear, simple, easily understood words & phrases
6. Careful selection & consistent use of appropriate words & terms
7. Cited sources within the text in accordance with APA, paragraphs 3.34 - 3.39 and 3.101 - 3.102
8. Included at least one table or figure, also referred to in text
9. Included a list of references (several)
10. No less than 6 & no more than 10 pages of text
11. Included a glossary of key words & terms used in the paper
12. No need to include (a) Author Notes, (b) Footnotes, or (c) an Abstract
13. With assistance as required
14. Submitted on ________________________

TEST ITEMS:

C²99

Page 1 of 2

Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Information Sheet

TIPS FOR SUCCESSFUL WRITING

To meet requirements for effective written communications, study Chapter 2, Expression of Ideas, and Chapter 3, APA Editorial Style, in the Publication Manual of the American Psychological Association (4th edition). In addition, consider the following guidelines:

1. Adequate time must be allowed for (a) planning, (b) information gathering, (c) writing, (d) review, and (e) revision, so as to meet the deadline without undue haste.

2. In order to achieve effective and efficient communication, (a) write from an outline, (b) self-review the manuscript a day or so after it is written, and (c) have someone with the requisite skills critique the manuscript. Improvement is always possible.

3. The subject, topic, or problem to be pursued should be stated in a clear and concise manner.

4. Lead with the most important information — Don't bury the main point in the middle of a paragraph or the reader might miss it. To discover what your main point or main sentence is, read a paragraph. Now decide which sentence would be the last one you would toss out. That sentence is your main point for the paragraph.

5. Make writing easy and pleasant to read by using the following by using the following techniques: (a) indent main points in a paragraph; (b) use boldface or italic type to emphasize important statements; (c) use lists and bullet points to create white space which rests the reader's eyes; and (d) use subheadings to organize the presentation and break space. Think of things you've read that appeal to you. Save those examples and use the devices you like in them.

6. If you want your writing to be understood, keep the reader's needs, concerns, and point of view in mind as you write and revise. Avoid unfamiliar language or terms, and address questions you know the reader will logically have about your subject.

7. Don't overwrite and don't be reluctant to cut. Every written communication should serve a useful purpose. Avoid overburdening the reader with unnecessary words and information. Consider the impact of the Declaration of Independence, the Gettysburg Address, and the Lord's Prayer. Remember, the reader's time is valuable. Never use a paragraph when a sentence will do — always strive for brevity.

Be concise. Do not over-elaborate and extend the text beyond its effectiveness. Make your written communications as short as possible, yet maintain the clarity necessary to impart the necessary information. Two things happen if you are not concise — the reader may (a) not get to the crux of the problem because it seems a waste of time to wade through excess wordage, and (b) lose the emphasis that should be placed on various areas.

8. Use (a) one-, two-, or three-syllable words; (b) under twenty-word sentences; and (c) under ten-line paragraphs,. Anything more looks "too involved!"

9. Avoid injecting your opinion. Reference the work of recognized experts on the subject in order to make your case.

10. Quote directly what cannot be better said in your own words. Don't forget to cite the source of quotes, information, illustrations, etc; consult the APA Manual.

11. Keep first person "I" out of writing. Third person writing is powerful.

12. Avoid qualifiers and vague modifiers — Don't use modifiers that almost say what you want when you can find ones that are exact.

Close	**Exact**
The flight was very late.	The flight was 4 hours late.
The young trainee	The 16-year-old trainee

13. Don't use cliches (e.g., gut-level response, two-way street, cover all bases) — Worn-out expressions can wear a reader's patience thin.

Trite	**Natural**
First and foremost	First

14. Avoid exaggeration — Avoid the superlative when you write. The greatest, the worst, the prettiest all leave you open to exception. To avoid arguments from the reader, avoid overstating your position.

15. Use correct grammar, spelling, capitalization, and punctuation. Rewrite awkward phrases and use easy-to-understand words with specific meaning. Typing and copy quality should be given careful attention.

16. Sum it up — The last paragraph should summarize what you've been discussing.

Use the methods and mechanisms of effective writing to the best of your ability. Bear in mind that self-evaluation and objectivity are absolutely necessary for you to grow in effectiveness. To become an accomplished writer takes practice. The more you write, the more you think about writing, and the more you read the good writing of others, the more successful you will be at writing.

Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Progress test No. 1

HISTORY OF TRAINING

Directions: Each of the following items contains four (4) alternatives, one of which provides the **best answer**. Circle the letter which precedes the best answer.

NOTES

1. A result of America's change from an agrarian to an industrial economy was

   A. the substitution of apprenticeship for most other types of training.
   B. a de-emphasis on agricultural training.
   C. reduced interest in training programs because of high unemployment.
   D. the establishment of vocational education in schools to augment apprentice training.

2. History shows that the greatest stimulus to the growth of training in the United States has been

   A. wartime skilled workforce needs.
   B. the decreasing influence of the profit motive.
   C. the prosperity of the 1920's.
   D. skilled worker supply/demand imbalances.

3. The program to train shipyard workers during World War I was based on the principle of

   A. classroom training separated from the worksite.
   B. traditional apprenticeship training.
   C. show, tell, do and check.
   D. avoiding the use of work supervisors as trainers.

4. Which of the following is true of the Job Instructor Training program of World War II?

   A. It was oriented to first- and second-line supervisors.
   B. It taught how to instruct and emphasized human relations between the supervisor and worker.
   C. It was originally designed for use in defense industries.
   D. All of the above.

TRADITIONAL BELIEFS BASED ON WISDOM AND COMMON SENSE

Questions about workforce education and training were once answered by turning to the accumulated wisdom and common sense portrayed in the following old sayings. These tried-and-true adages may have been the earliest guiding principles (statements of best practices). Each of the 31 maxims listed here continues to provide a sound basis for practical action.

SAYING: An **adage**, **proverb**, or **maxim**; expression of wisdom or truth

ADAGE: An old saying tested over the years until popularly accepted as a truth

PROVERB: A piece of practical wisdom expressed in homely, concrete terms

MAXIM: A concisely expressed principle drawn from practical experience and serving as a rule; a popularly accepted saying that contains the wisdom of the past and many nations.

AXIOM: A statement accepted as true, because it is obvious/self-evident.

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1. Learn by doing (We learn to do by doing)
2. Learn from experience (Experience is the best teacher)
3. Practice makes perfect
4. Skill comes from drill
5. Use it or lose it (If you don't use it, you will lose it)
6. We learn best what is meaningful
7. A picture is worth a thousand words
8. Seeing is believing
9. Plan your work; work your plan
10. A stitch in time saves nine
11. Haste makes waste
12. Better late than never
13. If it's worth doing, it's worth doing right
14. It's easier to do it right the first time than to explain why you didn't
15. Never enough time to do it right the first time, but always time to do it over (If you don't have time to do it right, when will you have time to do it over?)
16. It's better to aim for excellent and hit good than to aim for good and hit average
17. Nothing motivates like success
18. Being ignorant is not so much a shame as being unwilling to learn
19. Knowledge is power
20. School ends, but education doesn't
21. You are never too old to learn
22. The first thing to learn in school is how to learn
23. A wise man is a good listener
24. Unlearning is harder than learning
25. Before you get to the three R's, you've got to master the three L's — look, listen, and learn
26. Learn from your mistakes
27. Two heads are better than one
28. You cannot teach what you don't know
29. You cannot teach a man anything; you can only help him to find it within himself
30. You can lead a horse to water, but you can't make him drink
31. You can tell the quality of the workman by the quality of his tools

Contemporary Learning Theories

Theories	Assumptions	Basic components	Instructional considerations
Operant conditioning (B. F. Skinner)	Learning is behavior; behavioral change, represented by response frequency, is a function of environmental events and conditions.	S^D - Response - $S^{reinf.}$	Analyzing states, such as readiness; analyzing aversive classroom practices; individualized instructional materials.
Conditions of learning (Robert Gagne)	Learning is more than a single process, and its distinct processes cannot be reduced one to the other.	Five varieties of learning, each with its own set of internal and external conditions.	Identifying capabilities to be learned; selection of appropriate instructional events; task analysis for cumulative learning.
Information processing	Memory is a complex and active processor and organizer of information that transforms learning into new cognitive structures.	The processes of perception, encoding, and storage in long-term memory, and problem-solving.	Linking new learning to cognitive structures; providing processing aids in comprehension and problem-solving.
Cognitive-development (Jean Piage)	Intelligence constructs the structures that it needs to function. Knowledge is an interactive process between the learner and the environment.	Assimilation and accommodation, regulated by equilibration; physical experience and logico-mathematical experience.	Providing opportunities for experimentation with physical objects with peer interaction and support from instructor questions.

(table continues)

Theories	Assumptions	Basic components	Instructional considerations
Social learning (Albert Bandura)	Learning is a three-way interaction among the (a) environment, (b) personal factors, and (c) behavior.	Modeled behaviors, direct, vicarious, and self-reinforcement; and the learners' cognitive processes.	Providing models, reinforcement, and rehearsal; developing efficacy and learners' self-regulation.
Attribution (Bernard Weiner)	The search for understanding is a primary motivator. Attributions are complex sources of information about outcomes, and future action is derived in part from perceived causes of prior outcomes.	Expectancies and self-esteem are influenced by six attributions and their three dimensions.	Identifying psychological linkages between beliefs and action and the linkages between classroom activities and trainees' beliefs about themselves; the role of helping behavior

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HIGHLIGHTS OF EARLY UNIONISM IN THE U.S.A.

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1. Workers reacted to the disadvantages of their roles by forming producers' or consumers' cooperatives designed to restrain management control, by political action aimed at (a) overthrowing the wage system, and (b) bringing pressure on employers by forming unions.

2. The union movement in the U.S.A. began in the latter part of the 18th century with associations of workingmen. They pledged not to work alongside those who did not serve an apprenticeship.

3. First genuine strike occurred in 1786 by printers in Philadelphia.

4. Between 1792 and 1794, the first continuous workers' organizations appeared. Shoemakers in Philadelphia are an example.

5. Associations of masters fought unions through the courts, using the charge of conspiracy. Journeymen shoemakers were convicted of joining a conspiracy because they went on strike in 1806 and used collective bargaining to gain higher wages.

6. After the War of 1812, there was a long period of dominance by mercantile capitalism. Mills appeared alongside shop and home production.

7. Trade associations or unions were formed or reformed in many crafts. After 1820, strikes occurred in (a) craft shops and (b) mills (factories).

8. Early union unrest was a response to:

   - Mercantile employers' cost cutting by holding down wages, lengthening the work day, breaking down the master-worker relationship, and introducing women and children into industry.
   - Atmosphere of Jacksonian democracy, with its war against the aristocracy and exalting of common people.

9. Under adverse circumstances, workers organized against bankers and other aristocrats. They demanded an end to social inequality, imprisonment for debt, and child labor in New England mills.

10. **Equality of opportunity was the workers' slogan**, and the key, they thought, was a system of free education.

11. In the early 1830s labor moved, for a time, toward politics:

    - Workingmen's parties were formed in various cities.
    - Aim was to get labor representatives into the legislature.
    - Parties disappeared and labor merged with the Jacksonian movement.

12. The American workforce had no aims as a class; rather, workers wished to better themselves within the framework of capitalism and share in its benefits.

13. National Labor Union — formed in 1866

    - Composed of national, local, and city assemblies of trade unions and reformist movements.
    - Politically-minded **federal employees campaigned for 8-hour day, which was granted in 1868**.

14. First national strike occurred in 1877 by railroad workers. Touched off by a reduction in wages by the Baltimore and Ohio Railroad.

    - Militia called out to keep trains running.
    - Over 100 killed and several hundred wounded.

15. Knights of Labor — founded by Uriah S. Stephens in 1869

    - Initially a secret organization of skilled workers.
    - Reformist organization, rather than a revolutionary one.
    - Demanded government ownership of railways and telegraph systems and graduated income tax.
    - Interested in producers' cooperatives.
    - Favored boycott over strike.
    - Reached its peak in 1886. By 1893, only 75,000 of 700,000 left; virtually extinct by 1900. Causes:
        a. Inept leadership.
        b. Strikes ended disastrously.
        c. Working class split among racial, national, and religious groups, with employers exploiting these hostilities.

16. Haymarket riot in Chicago — 1886

    - Organizations of Socialist Labor Party sought to convince working class of the necessity for violent destruction of capitalism.
    - During struggle for 8-hour day at McCormick factory, lockout turned into a strike.
    - Fight between police and strikers led to a mass protest meeting; during the meeting, a bomb was thrown, killing several policemen.
    - Wave of hysteria broke over the country. Radicals were rounded up by the police. Eight leaders were arrested, tried, and convicted.
    - Consequences: (a) enabled employers to open a counteroffensive against labor movements in general, (b) convinced labor leaders of necessity to stay clear of

radicalism, and (c) symbolized possibilities and limitations of radical action by workers and the determination and ability of conservative forces to resist radicalism.

17. Breaking point between the Knights of Labor and the craft unions was reached during Haymarket riot.

    - Leadership of Knights of Labor opposed the membership's desire for a strike.
    - During a conference in 1886, delegates decided to form a new organization, the American Federation of Labor (AFL). Samuel Gompers was elected first president. AFL interested primarily in higher wages, greater job security, and better working conditions.

18. Craft union (AFL) — dominated labor movement until middle 1930s.

    - Samuel Gompers and Adolph Strasser built a strong union among cigar makers.
    - Gompers abandoned interest in revolutionary ideals and became an opponent of socialism. He typified conservative trade unionism in the U.S.A.

19. AFL superior to Knights of Labor

    - AFL provided for union autonomy, based on craft principles; suited the non-class-conscious American worker.
    - Proved that they knew how to organize and win strikes by limiting their objectives and size.
    - Dissociated themselves from radicals.

20. Homestead Strike — 1892 battle between the Association of Iron and Steel Workers (an AFL union) and the Carnegie Steel Company

    - Centered around plant in Homestead, Pennsylvania.
    - Decided to strike rather than accept terms of contract renewal.
        a. Company demanded that workers take a wage cut.
        b. Workers staged a strike when the company began a lockout.
        c. Company attempted to overcome the strike by bringing in Pinkerton detectives and more workers. A bloody battle resulted, killing 10.
        d. Strike leaders arrested on a murder charge.
    - Strike ended — November, 1892 — bitter defeat for labor.

21. American Railway Union — formed in 1893 by railway workers who were dissatisfied with conservatism and ineffectiveness of the "brotherhoods" (former organization of railroad workers)

    - Members employed by Pullman Palace Car Company had numerous grievances. They resented company owning all houses, banks, and utilities.
    - Strike demands were for reinstatement of discharged members, lowering of rent on Pullman houses, and restoration of formerly higher wages.

- Court injunction declared picketing illegal, and strike leaders were jailed. The strike collapsed.

22. Strike of United Mine Workers in 1902

    - Grievances — low pay, unfair methods of weighing coal, long hours, and dangerous working conditions.
    - Intervention by President T. Roosevelt resulted in strikers going back to work, pending the findings of an arbitration commission.
    - Consequences — several secondary concessions; main aim of recognition as a union was denied.

23. Clayton Act amended anti-trust laws and penalties of injunction. AFL grew from 4.2 million members in 1914 to 5.1 million by 1920.

24. Post-WW I labor conditions

    - Steel strike began in September, 1919, weakened in January, 1920, then collapsed.
    - Depression of 1921 resulted in considerable decline of trade union membership.
    - Company unions formed and, by 1926, had about half as many members as AFL.
    - Workers in non-union plants subjected to "yellow-dog" contracts, binding them not to join a union.

25. Depression years

    - Seven million people lost jobs by 1930; 15 million by 1932, and, thus, trade union membership declined more.
    - Norris-La Guardia Act passed in 1932, revoking power of judges to issue injunctions in labor disputes, and outlawing "yellow dog" contracts.
    - Wagner Act passed in 1935. National Labor Relations Board, an independent government agency, was formed to enforce provisions of Act.

26. New Deal — Committee for Industrial Organization (CIO)

    - Formed by dissatisfied delegates of 1935 AFL convention. The controversy which split the AFL and resulted in the formation of the CIO was largely a clash over personality and method rather than fundamental principles.
    - CIO unions were expelled from AFL, with exception of the Ladies' Garment Workers.
    - Rubber workers in Akron joined a union and went on strike, followed by General Motors workers in 1936/37 with a "sit-down" strike, and then by U. S. Steel Company workers.
    - CIO transformed itself into the Congress of Industrial Organizations in May, 1938, with basic principles and structure much like AFL.

27. Labor during World War II

- The War Labor Board was set up and labor yielded right to strike.
- Smith-Connally Act (a) gave President the right to seize any plant involved in war production, (b) demanded a 30-day notice of strike, and (c) forbade labor to contribute money to political campaigns.

28. Labor since World War II

- Greatest outbreak of strikes in American history — 1946.
- Taft-Hartley Act — 1947, restrictive legislation which cut union power.
    a. Prohibited unions from coercing members.
    b. Prohibited secondary boycott.
    c. Prohibited jurisdictional strikes.
    d. Banned closed shops.
    e. Granted employees the right to call plant elections.
- AFL and CIO merged — 1955
- Landrum-Griffin Act — 1959, provisions covered union elections, disciplining members, rights of members, trusteeships over local unions, etc.

29. A Comment. Perhaps the greatest single contribution of collective bargaining has been to insure equitable treatment of workers by employers. In any event, unions have provided improved conditions to workers and wages that are higher than non-union workers receive. Nevertheless, membership has declined to about 15% of the nation's workforce. However, based on current evidence, it appears that workers of the future will continue to want some control over their destiny, especially when productivity and profits increase while working conditions and job security decline. Without unions, workers would probably suffer losses beyond the growing disparity between what they are paid and the benefits received by top management.

Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Progress test No. 2

BEHAVIORAL SCIENCES IN TRAINING AND DEVELOPMENT

Directions: Each of the following items contains four (4) alternatives, one of which provides the **best answer**. Circle the letter which precedes the best answer.

NOTES

1. The Hawthorne studies from 1927-32 found that

   A. physical and environmental influences have little effect on worker efficiency.
   B. social interactions and group influences may have a stronger effect on work efficiency than physical factors in the environment.
   C. experimental methods are of little value in improving work effectiveness.
   D. higher wages are the best incentive for increased productivity.

2. Who is regarded as the "father of scientific management"?

   A. Elton Mayo
   B. W. Edwards Deming
   C. Frederick Taylor
   D. Samuel Gompers

3. One argument in favor of Douglas McGregor's Theory Y philosophy is that

   A. Theory Y allows a range of management approaches; Theory X permits only one.
   B. subordinates will always use self-direction in meeting organizational goals.
   C. employees will always seek responsibility.
   D. achieving security is the main motivation of employees.

4. Maslow's hierarchy of human needs predicts that a worker whose physiological, safety, social, and ego needs were satisfied would be motivated by

   A. salary increases.
   B. chances to satisfy self-fulfillment needs.
   C. chances to satisfy belonging and acceptance needs.
   D. fear of punishment or loss of reward.

Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Information Sheet

SCIENTIFIC MANAGEMENT

Scientific management was introduced to the public in 1911 during hearings before the Interstate Commerce Commission concerning increases in railroad freight rates. Shippers opposed the rate increase, charging that, instead, the railroads should operate more efficiently. During the hearings, eleven successful engineers testified that through something called **scientific management** it was possible to reduce costs. As a result of media attention, the phrase "scientific management" and the name of its developer — Frederick Winslow Taylor — were soon commonly known.

In 1878, at the age of 22, Taylor was hired as a laborer at the Midvale Steel Company in Pennsylvania. After completing an apprenticeship, he became a journeyman machinist. Following this, he was made gang boss in the lathe department, then foreman, master mechanic in charge of all maintenance, chief draftsman, and chief engineer — all within 6 years. During his 12 years at Midvale Steel, Taylor developed the system of shop management that was later to be called scientific management.

"Soldiering" was an accepted practice at Midvale Steel and other plants at that time. There were two kinds of soldiering — natural and systematic. Natural soldiering is the result of the human instinct to take it easy; today we might call it loafing. Taylor felt that a good foreman could prevent this. However, systematic soldiering arose from the belief that there was only so much work to be done: if a worker exceeded accepted productivity norms, someone else would be deprived of a job. Solving this type of soldiering was a challenge. Taylor's first approach was to establish **piece rates**, but this was not successful.

Taylor realized that the problem was not that the workforce didn't want to work, but rather that they and management did not share the same view of what made up a fair day's work for the wages paid. As a result, the workers and management argued. Consequently, Taylor set out to establish standards as to what constituted a fair day's work. He conducted experiments to establish what his workers ought to be able to do with the equipment and materials they were provided. Taylor thought he could finish the experiment in 6 months; however, he was still working on the problem a quarter of a century later.

To arrive at productivity standards, Taylor withdrew machine tools from the shop floor, appropriated scrap materials, and recruited a journeyman machinist to assist him. He observed and studied variations in the operation of the machine tools, such as belting, shafting, tooling, speeds, feeds, materials, and motions. His ultimate goal was to discover the combination of conditions that would maximize productivity.

In addition to establishing productivity standards for Midvale Steel, Taylor's studies led to publications such as his Notes on Belting. Among other by-products was the discovery that a stream of water, directed on the chip at the point where it was being cut from a workpiece, permitted an increase in cutting speed, thereby increasing production as much as 40%. These studies also led to the development of high-speed tool steel.

In the years that followed, many industries began to utilize Taylor's findings. Such concepts as unit-time study became the basis for planning and scheduling, better methods of inventory control, cost accounting, production control, and quality control. Some time later came micromotion study (study of repetitive operations by means of slow-motion pictures).

Taylor did not publish his management ideas until 1912 when the American Magazine hired him to write articles for technical audiences. An out-growth of one of his articles was a definition of scientific management that included the (a) scientific selection of workers, (b) scientific education and development of workers, and (c) friendly cooperation between management and the workforce. Also in 1912 Taylor appeared before a special committee of the House of Representatives to describe scientific management. This was his final statement of principles, as he died in 1915.

One principle of scientific management is that the worker is to perform assigned tasks in an assigned manner. This is accomplished in the archetypal work organization with a high degree of specialization and division of labor. Each worker is given a fixed task to be repetitively performed. The worker develops expertise in performing that task, rather than the broader knowledge or more general skills that may accompany more varied tasks. In Taylor's words,

> The most prominent single element in modern scientific management is the task idea. The work of every workman is fully planned out by the management ... and each man receives in most cases complete written instructions, describing in detail the task which he is to accomplish, as well as the means to be used in doing the work. This task specifies not only what is to be done, but how it is to be done and the exact time allowed for doing it.

This work organization requires a hierarchical, regimented environment in which there are layers of management to assure that decisions are correctly executed. Through the "chain of command," decisions are communicated to workers who are instructed in what they are expected to do. They are then closely monitored to assure that they do as they are told.

PEER TRAINING AND TEAMWORK

Clifton P. Campbell

The University of Tennessee

The premise is that, on the job, some of the most relevant and effective learning takes place efficiently worker to worker. For example, learning might best occur when an experienced worker shows a new employee how to use a tool correctly and safely, rather than waiting for a scheduled training session. This type of peer training happens naturally in the workplace and is, more often than not, spontaneous, need-specific, and therefore highly relevant. In addition, people rarely work in isolation: indeed, in today's highly competitive global marketplace, teamwork is responsible for improving organizational performance. While "peer training" and "teamwork" are recognized methods of learning and working, they are not used in a combined form as often as they could be.

Competitive Structure

Formal education and training systems generally focus on studying and learning alone, rewarding with the highest grades those who are successful in their competition with classmates rather than those who cooperate with others and contribute to group success. It is often the case that an individual can attain a personal goal (an "A" grade, for example) only if others fail to attain theirs.

For those who are competitive by nature, this traditional approach is acceptable. Nevertheless, it is common knowledge that when people cooperate on a project (without wasting energy and time on competitiveness), they can create powerful results, better than what most individuals, working on their own, could achieve.

Initiating Cooperation

At the beginning of a training program, some trainees may resist the idea of peer training and the support of team mates because of a reluctance to risk personal achievement by working with others who may not share their goal. Comments from trainees regarding this reluctance include:

"I don't see the relevance of teams and prefer to work alone."

"Some will do little work, learn nothing, and yet receive the grade earned by team mates."

Some trainees are uncomfortable working with strangers. Admittedly, trainees with friends or acquaintances from the workplace or other training programs have an advantage at first. Once the "ice is broken," however, many trainees have said they value learning and working with someone new.

One activity that helps trainees get acquainted is having them prepare a notice (on a sheet of paper) that contains relevant information such as:

1. What attributes they want in team mates (e.g., people who work hard and are motivated to achieve high grades, or possibly people that want to socialize)
2. What they can offer a team (e.g., sense of humor; loyalty; previous experience with the instructor; computer, research, or editing skills)
3. Topics/subjects in which they have expertise and interest
4. Preferred method of communication — in-person meetings, telephone, faxes, e-mail, etc.
5. The geographic locations where they live and work
6. What days/times they could meet outside of class

The notices can then be read or distributed to classmates, posted in the room, and so forth. When this activity takes place before trainees have even associated names with faces, it is advisable to have individuals include a recent photograph on the notice.

Forming groups. Among the many ways to organize groups are

1. Assign trainees to a group based on their ability, background, interest, personality, etc. (time-consuming, and requires the accumulation of information on which to base assignments)

2. Pull names out of a hat (this reduces trainee autonomy)

3. List all trainees alphabetically, by their last name, then separate the list into a predetermined number of groups by (a) combining all A's and B's to form a group, all C's and D's to form another group, etc.; or (b) counting down the list 1, 2, 3, and then forming groups of all 1's, all 2's, etc.

4. Have trainees verbally count off (e. g., 1, 2, 3, 4, and then form teams of 1's, of 2's, of 3's, etc.)

5. Combine trainees who live or work in the same geographic area (to facilitate in-person meetings)

6. Combine trainees who prefer to use e-mail, fax, etc. rather than in-person meetings

7. Invite trainees to team up with people they know

8. Invite trainees to wander around the room "sensing" each other and chatting with people they "feel" they have empathy with

9. Leave the method of choosing team mates (and the consequences) up to the class

Group size. Two factors to be considered in determining group size are (a) the larger the group, the more personalities there are to deal with; and (b) there should be sufficient opportunities for each trainee to participate. Research on the size of decision-making groups found that as group size increased from 5 to 12, consensus resulting from discussion became more difficult and took longer. Furthermore, when groups grew larger than 12, communication and cohesion became problems which led to factionalism. When in doubt about group size — start small. Experience shows that groups of 3 to 5 work well.

Uses of This Approach

The peer training and teamwork approach may be used for a host of different activities:

1. Questioning one another's generalizations, ideas, assumptions, understandings of what the instructor said, etc.

2. Aiding recall — ask each other the main points in the previous lecture/discussion; quiz one another on key concepts, and so forth

3. Solving problems by drawing on one another's skills, experiences, learning methods, and contacts

4. Discussing assignments — verbally analyze the question(s) together, but write up the assignment separately

5. Completing team assignments

6. Task-related brainstorming

7. Being alert for information useful to a team mate — exchange photocopies of material, for example

8. "Showing the ropes" to newcomers

9. Proofreading and critiquing each other's assignments before they are submitted

10. Offering constructive feedback and providing mutual support

Moreover, researchers pointed out that when team members have complementary skills and expertise, their achievement is enhanced. In addition to this, Nancy Day wrote in "Informal Learning Gets Results" (in *Workforce*, June 1998), researchers found that teams were actually one of the richest sources of informal learning.

The teamwork experience provides opportunities to develop and practice interpersonal and negotiation skills — two skills employers say they want. There are many ways in which team members have helped one another:

> "Working and learning within a group made me feel more secure because my team mates understood my concerns and problems."
>
> "I appreciated the sense of identification with a group. It made me feel less lonely; I also enjoyed the responsibility of looking after someone else's interests."

Some unanticipated benefits were the way team mates strongly motivated and brought out the best in one another:

> "She gave me the push I needed and the motivation to keep going."
>
> "He boosted my confidence when I was down."

Team Attributes

The following are distinctive attributes of a cooperative and productive team.

Agreement on high expectations. All members have a will to excel. Principal motivators are ethical behavior, high performance standards, quality, accuracy, and excellence. Mediocrity is not tolerated. The catchphrase is, "Until something meets our standards, we won't submit it."

Commitment to common goals and a climate of trust. Goals provide team members with a common focus. When they are agreed to by a consensus (not a majority vote), all members accept them. Further, they realize that the goals can be achieved only through a collaborative team effort. In addition, all team members have an unquestioning belief in their team mates. Trust is the glue that holds the group together.

Open communications and access to information. Team members realize that communication is important and necessary. They honestly and openly express their thoughts and feel free to ask questions relevant to the work being done. There are no hidden agendas; everything is above-board. Information is viewed as a vital resource, and the leader is responsible for assuring that all members have the information needed to accomplish their tasking.

Assumed responsibility for work. The work is divided equitably, with each member having clearly defined tasks to perform. In addition, there is a commitment to do anything that needs doing. All members of the team hold themselves mutually accountable.

Table 1 was prepared based on a review of the literature. It shows the outcomes that various authors have identified for the competitive and cooperative approaches to learning and working.

Table 1. Outcomes Attributed to Competitive and Cooperative Approaches

Outcomes	Competitive	Cooperative
A drive to excel in personal performance	✓	
Ownership, a need to be one's own boss	✓	
Self-reliance	✓	
Efficient completion of learning and practice activities/projects	✓	
Higher retention plus transfer of information and skills to the workplace		✓
Integration of analytical, innovative, and executive skills		✓
Verbal abilities		✓
Cross-functional: more than one way, out-of-the-box thinking		✓
Creative ability: divergent and risk-taking, productive controversy		✓
Interpersonal skills: leadership, communication, problem-solving, critical thinking, conflict resolution, etc.		✓
Acceptance and appreciation of individual differences		✓
Positive interdependence		✓
A sense of belonging, feeling psychological acceptance		✓
Sociability		✓
Support, motivation		✓
Personal accountability, recognition	✓	✓
Mastery of concepts, principles, and processes	✓	✓

Note. The outcomes are presented in random order by category.

A Comment

Peer training and teamwork are not arbitrary notions or fads. The idea of people learning and working together dates back to the beginning of civilization, when survival depended upon the acquisition of food-gathering and defensive skills, as well as the ability of the group to get along with each other. A difference between the historical roots of peer training and teamwork and the process that exists today is the deliberate effort to create and maintain a small group of people who learn and work well together and enjoy doing so, while producing high-quality results.

By encouraging trainees to learn and work together, rather than to compete with each other, we are responding in a positive way to contemporary workplace practices. Moreover, trainees do not feel so alone as they progress through learning activities.

Effective and Ineffective Teams

Effective	Ineffective
Climate/Culture	
- Honest and open communication - Concern for all individuals - Commitment to team performance - Trusting and flexible - Motivating and energizing	- Guarded or self-serving communication - Authority-directed problem solving - Emphasis on rules and a rigid attitude
Participation	
- Everyone gets assignments and completes them on time - All members listen to one another - All ideas are given a fair hearing - Both participation and goal achievement are emphasized - Time and effort are directed to developing strong interpersonal relationships and building individual problem-solving skills	- Dominated by strong member(s) - Some ideas are ignored or overridden - Hidden agendas in contrast to team agenda - Members express indifference or hostility to others - Individual members avoid assignments or submit poor quality work after the due date
Leadership	
- Shared responsibility - All members feel responsible for contributing to team goals - Different members, because of their knowledge or abilities, act as "resource expert" at different times; thus leadership roles change as the tasks and needs of team change - As leadership roles change, all team members are supportive - Confidence in each member's abilities	- Delegated by position or influence - Position determines influence - Power is concentrated in authority positions - Obedience to authority is the norm

Conflict Management

- Controversy is viewed as positive and essential to the problem-solving process
- Disagreements may be frequent and candid, but are also relatively comfortable
- No personal attacks; criticism is constructive and even supportive in nature

- Disagreements may be suppressed or "resolved" by a majority vote, which leaves an unconvinced minority
- Criticism is embarrassing and tension-producing, often leads to accommodation or compromise

Decision

- Reached by consensus
- All members are customarily in agreement; however, there is little tendency for those in opposition to simply "go along"
- Disagreements are used constructively and formal voting is held to a minimum

- Group discussion or involvement may be solicited, but strong member(s) makes final decision
- Those in opposition are expected to conform even though they remain unconvinced

Title of Training Program: Surveying Coordinator: C. P. Smith

Activity number	Activity name	Person(s) responsible	Start & due dates	Work weeks
	Planning			
01.	Set dates/schedule training	C. P. Smith	5/10 - 5/22	
02.	Organize curriculum team	C. P. Smith	5/16 - 5/22	2
	Before Training			
03.	Analyze training policy	C. P. Smith	5/30 - 5/31	
04.	Analyze training needs	R. W. Jones	6/01 - 6/8	
05.	Analyze the job	G. C. Robins	6/13 - 6/24	
06.	Analyze target population	T. W. Powell	6/13 - 6/17	
07.	Develop learning objectives	R. W. Jones	6/17 - 7/13	10
08.	Develop tests	R. W. Jones	7/14 - 7/27	
09.	Specify instructional delivery system	T. W. Powell & R. W. Jones	7/25 - 7/29	
10.	Organize resources	T. W. Powell	8/1 - 8/5	
	During Training			
11.	Instruct trainees	T. W. Powell	8/29 - 10/28	9
12.	Evaluate trainees and program	R. W. Jones		
	After Training			
13.	Analyze evaluation data	T. W. Powell	11/1 - 11/3	
14.	Write evaluation report	T. W. Powell	11/4 - 11/10	4
15.	Examine report findings	C. P. Smith	11/11 - 11/12	
16.	Revise training curriculum	T. W. Powell	11/15 - 11/26	

Total = 25

Example of a Scheduling Work Sheet

PLANNING WORKSHEET (MILESTONE CHART)

STEPS		Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
I.1	Analyze Job	○ 6 - - ● 11 —	- - - - — —	- - △ 16 — ▲ 16	- - □ 11 — ■ 14								
I.2	Select Job Tasks for Instruction												
I.3	Construct Job Performance Measures												
I.4	Analyze Existing Courses												
I.5	Select Instructional Setting												
II.1	Develop Objectives												
II.2	Develop Test Items												
II.3	Describe Entry Behavior												
II.4	Determine Sequence and Structure												
III.1	Specify Learning Events/Activities												
III.2	Specify Inst. Delivery Sys. & Mgt. Plan												
III.3	Review/Select Existing Inst. Mat.												
III.4	Develop Instruction												
III.5	Validate Instruction												
IV.1	Implement Inst. Management Plan												
IV.2	Conduct Instruction												
V.1	Conduct Internal Evaluation												
V.2	Conduct External Evaluation												
V.3	Quality Control and/or Revise System												

LEGEND

○	= planned commencement date	●	= actual commencement date
- -	= planned development time	—	= actual development time
△	= planned completion date	▲	= actual completion date
□	= planned management approval of completed step	■	= actual management approval of completed step

BEST COPY AVAILABLE

TEAM MEMBER RATING FORM

Project title ____________________

Team member rated ____________________ Rater ____________________

Ratings:

1 — Unacceptable	Performance **did not** meet requirements. Add a comment to support your opinion.
2 — Needs Improvement	Performance met some but not all requirements. List improvement(s) needed in comment space.
3 — Acceptable	Performance met all requirements.
4 — Excels	Performance excelled in all areas.
5 — Outstanding	Performance exceeded all requirements and is of highest caliber. Add a comment to support your opinion.

Categories:

MEETING DEADLINES:

Dependable and reliable, met deadlines in performance of group project. Managed and budgeted time. Accommodated needs of the team.

Rating: ___ Comment: ____________________

PROFESSIONALISM:

Implemented professional qualities into all actions. Assumed responsibility for work that must be done. Was prepared for and participated in meetings.

Rating: ___ Comment: ____________________

TEAMWORK:

Helped team meet its objectives. Willing and capable of leading team in proper direction. Helped to keep team focused and on task and did his or her share of the work.

Rating: ___ Comment: ____________________

INTERPERSONAL SKILLS:

Demonstrated communication, problem solving, and negotiation skills.

Rating: ___ Comment: ____________________

Suggestions: ____________________

____

____

____

TEAM MEMBER EVALUATION FORM

Assignment Sheet No. ______ Project Title ______________________

Team member evaluated ______________________ Evaluator ______________________

Directions: Circle the number that, in your opinion, most closely corresponds to the team member's performance.

	Ineffective				Effective
Performance	1	2	3	4	5
1. Attended project meetings	1	2	3	4	5
2. Arrived on time and stayed for entire meeting	1	2	3	4	5
3. Was prepared for and participated in meetings	1	2	3	4	5
4. Listened to comments by others, provided knowledgeable insights, and accepted constructive criticism	1	2	3	4	5
5. Did his or her share of the work	1	2	3	4	5
6. Performed quality work in a timely manner	1	2	3	4	5
7. Exhibited sound judgment and decision-making skills	1	2	3	4	5
8. Exhibited ability and willingness to provide leadership	1	2	3	4	5
9. Was dependable/reliable	1	2	3	4	5
10. Exhibited organizational and problem solving skills	1	2	3	4	5
11. Conveyed a professional/cooperative attitude	1	2	3	4	5
12. Worked well with others	1	2	3	4	5

Comments: ______________________

____

____

____

C^2

TEAM MEMBER RANKING

Introduction:

One problem of having people work in groups is that some contribute more than others to the success of their group's project. It is impossible for the instructor to know all of what happened during the preparation process.

One way of collecting information about individual contributions is to have each group member rank all others. Ranking is not an expression of grades such as A, B, C, etc.

Instructions:

Please rank order the contributions of the individuals in your group by writing the name of one member of your group on each of the lines provided below. Ranking should be assigned as follows:

1 — the person who contributed the most to the group project

2 — the person who contributed the next-most to the group project

3 (or last ranking number) — the person who contributed the least to the group project

Do not rank yourself. Assign each rank to only one individual (no "ties"). You are encouraged to add comments (under the heading **Comments**) to support your rankings. Do not share your rankings with others in your group or the class.

When you have completed this ranking sheet, sign it in the space provided, fold it, and give it to your instructor.

Rank **Name**

1 ____________________

2 ____________________

3 ____________________

Comments:

____

____

____

____________________ (Signature) ____________ (Date) C²

Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Progress test No. 3

ORGANIZATION AND MANAGEMENT OF TRAINING

Directions: Each of the following items contains four (4) alternatives, one of which provides the **best answer**. Circle the letter which precedes the best answer.

NOTES

1. Managers can conclude that a formal training program will be useful when

   A. specific skills are required for successful job performance.
   B. individuals' performance does not meet job standards.
   C. the organization is not meeting goals included in annual or long-term plans.
   D. problems exist that can be solved by giving personnel identifiable items of knowledge, skill, or attitude.

2. When originally organizing training efforts, the first task is to

   A. recruit staff for the training department.
   B. study the organization to determine training needs.
   C. decide on the internal organization of the training department.
   D. survey the training that competitors use.

3. To perform the evaluation function successfully,

   A. courses and programs must have performance objectives.
   B. a comprehensive evaluation must be conducted.
   C. operating plans must be as long term as possible.
   D. training activities and staff must be organized by function.

4. The most important function of a training policy is to

   A. describe training programs to be carried out.
   B. enumerate the problems that led to the establishment of a training program.
   C. show how training will help achieve organizational (workplace) goals.
   D. convince top management that training is necessary.

Human Resource Development

The University of Tennessee
Information Sheet

WORKPLACE GOALS THAT JUSTIFY INVESTING PRIVATE RESOURCES IN TRAINING

The most important result of performance-based/results-oriented training is a measurable improvement in an individual's contribution to **workplace/organizational goals (strategic objectives, business results)**. Those goals listed here are used in determining the benefits of training and/or the return on a training investment.

- 1.00 **Improved/Increased/Enhanced/Higher/More/Better/Greater**
  - 1.01 Increased **quantity** (a) rate of production, (b) amount produced, (c) output
  - 1.02 Improved **quality** (a) degree of excellence, (b) conformance to requirements, (c) durability (long-life), (d) fitness for use, (e) absence of defects, (f) reliability
  - 1.03 Higher **standards**
  - 1.04 Improved **accuracy** (a) precision, (b) exactness
  - 1.05 Increased **productivity**
  - 1.06 Enhanced **performance**
  - 1.07 Increased **effectiveness**
  - 1.08 Improved **efficiency**
  - 1.09 Higher **utilization** of machines and equipment
  - 1.10 Better use of **resources**, (a) money, (b) time, (c) personnel
  - 1.11 More **variety**
  - 1.12 Improved **products**
  - 1.13 Improved **service**
  - 1.14 Enhanced **employee versatility and proficiency**
  - 1.15 Improved **safety and health**
  - 1.16 Improved **morale, personal satisfaction, attitude, motivation, trust**
  - 1.17 Greater **dependability**
  - 1.18 Improved **teamwork**
  - 1.19 Higher **integrity and ethics**
  - 1.20 Increased **employee satisfaction, identification with the organization**
  - 1.21 Improved **public image, relations**
  - 1.22 Enhanced **customer service satisfaction, retention**
  - 1.23 Increased **competitiveness**
  - 1.24 Increased **sales**

1.25 More **market-driven**

1.26 Better **cost containment**

1.27 Increased **profitability, economic growth, market share**

2.00 **Reduced/Decreased/Lower/Fewer/Less**

2.01 Fewer **faults/defects** and **rejects** (less rework)

2.02 Fewer **errors/mistakes**

2.03 Reduced **scrap/waste/materials costs**

2.04 Less **discarded paperwork**

2.05 Less **damage** to tools and machines (less **downtime**)

2.06 Decreased amount/frequency of **supervision**

2.07 Decreased **labor cost, overtime, workforce**

2.08 Reduced **warranty expenses** (buy backs)

2.09 Fewer customer **complaints**

2.10 Fewer **accidents, medical and workers compensation claims**

2.11 Less **tension, conflict, litigation** (fewer **grievances**)

2.12 Fewer **lawsuits** and **fines**

2.13 Less **lateness** and **absenteeism**

2.14 Fewer requests for **transfer**

2.15 Reduced employee **turnover** (increased retention)

2.16 Reduced **expenditures**

2.17 Lower **production/operating costs**

2.18 Reduced **lead time**

2.19 Reduced **cycle time**

2.20 Reduced **time to market**

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Information Sheet

WORKFORCE TRAINING

Linking Training to Organizational Goals

Most organizations are not in the business of training employees except when doing so contributes directly to their goals. **Organizational** (workplace) **goals**, also known as strategic objectives or business goals/objectives/results, **which justify training include:**

1. Better quality (meet or exceed requirements, fitness for use, durability, reliability)
2. Improved standards/accuracy
3. Increased productivity/quantity/output/performance/efficiency
4. Increased worker versatility and proficiency
5. Improved morale/attitude/dependability
6. Improved safety and health
7. Better products and service
8. Better utilization of machines and equipment
9. Fewer defects and rejects (less rework)
10. Reduced scrap/waste/material costs
11. Less damage to tools and machines (less downtime)
12. Lower operational/unit costs and increased profitability
13. Decreased amount/frequency of supervision
14. Less worker absenteeism and turnover
15. Decreased customer complaints and warranty costs
16. Fewer accidents and medical claims
17. Less conflict, litigation (fewer grievances)

It can be argued that some of the above organizational goals are not legitimate reasons for training; but rare indeed is the professional who would argue that none of these outcomes ever accrues to a training effort.

Alternatives to Training

Training tends to be the universally suggested solution to performance problems. While it is the **appropriate activity** when (a) required by a government regulation (compliance training) (b) **new skills are required**, or (c) **existing skills are deficient**, training cannot correct all organizational problems. Consequently, **the following alternative interventions should be considered before training is prescribed**.

1. Changes in management and supervision, e.g., replace adversarial relationships between management and the workforce with cooperation, and improve supervision, mentoring/coaching/counseling
2. Employee empowerment (involvement, decision making, responsibility, etc.)
3. Improved methods of worker selection
4. Communication of job performance requirements and standards, along with regular feedback

5. Use of job performance aids
6. Put existing knowledge and skills to their most effective and efficient use
7. Reassigning employees
8. Changes in job requirements (job redesign, enlargement/enrichment or job rotation)
9. Better working conditions/environment (ergonomics)
10. Recognition and reward of high level performance (financial incentives as well as other forms of appreciation)
11. Better pay and benefits
12. Providing high quality tools, equipment, materials, and supplies
13. Introduction of new technology and automation (machines, processes, etc.)
14. Improved morale, motivation, and workplace harmony
15. Attention to interpersonal, group, and intergroup behaviors
16. Job security
17. Advancement (promotion) based on merit and seniority
18. Tactful discipline

Distinguishing Between Education, Training, and Development

Table 1 on page 3 facilitates a comparison of **education**, **training**, and **development** in terms of six factors (i.e., definition, purpose, expected outcome, scope, time frame, and relationships). It is reasonable to conclude that a training system differs from a formal education system in that **training focuses on**:

1. Specific requirements based on a needs assessment and job analysis
2. The prompt application of knowledge and skills acquired
3. Practice on operating equipment with supervision by an instructor or knowledgeable worker
4. Direct relationships to a particular job

Formal education systems, on the other hand, **focus on**:

1. Future applications of learning
2. Indirect relationships to a job or occupation
3. Implied learning for use in unpredictable situations
4. Social coherence, successful living within a culture

Finally, **development deals with**:

1. Projected or forecast needs of a nation or organization
2. Orientation toward the entire economy or sectors of the economy
3. Organizational requirements

While their focuses differ, training is effective to the extent that:

1. Graduates of the formal education system have acquired the basic knowledge, skills, and attitudes necessary as a foundation for job training.
2. Instruction is based on performance requirements for jobs with favorable employment prospects.

Table 1

A Comparison of Education, Training, and Development

Education	Training	Development
Definition		
Learning experiences to develop the whole person — mind, character, personality; learning concepts and rules, etc. by formal schooling	The use of practical experiences and theoretical insights to prepare individuals for gainful employment as skilled workers or technicians	Process of growth by which a nation or organization expands the number or modernizes the nature of its activities
Purpose		
To promote a just society; impart knowledge, skills, and values needed in a complex culture; critical thinking; and academic excellence	To supply the knowledge, skills, attitudes, and qualifications necessary to enter and progress in a particular job	To assure organizations of a skilled workforce, technology, and equipment to meet previously established national goals
Expected outcome		
Individuals with social skills and a foundation for lifelong learning	Individuals who can perform job tasks proficiently in order to meet predetermined workplace goals: increased productivity, higher earnings, etc.	Competitive organizations which (a) engage in new processes and/or products; and (b) acquire the systems, materials, and workforce to remain operative
Scope		
Deals with broadly applicable abilities, attitudes, and values	Deals with specific tasks, identified through a job analysis, requiring certain knowledge and skills	Involves complex sets of tasks and requirements of the entire economy or sectors of the economy
Time frame		
Long-term effort; deals with possible future applications of learning	Deals with current needs and prompt application; short-term orientation is normal	Deals with projected or forecast needs on a long-term basis
Relationships		
Administrative interfaces with politicians, policy makers, special interest groups, and teachers	Consultative interfaces among managers, workforce planners, job analysts, and a host of other specialists	Consultative and administrative interfaces by policy makers, workforce planners, and other groups as appropriate

Training cannot and should not be completely separated from formal education, though their goals and approaches differ.

The Role and Purpose of Workforce Training

Privately-funded training is appropriate when there is a deficiency in knowledge and skills. This can happen when (a) new workers are hired, (b) new equipment is purchased, (c) a worker is promoted or transferred, (d) new jobs are created, (e) jobs are to be performed in new ways, or (f) jobs are being performed in deficient ways by incumbent workers. **Publicly-funded** training is appropriate when one or more of the following situations exist:

1. Workers with specific skills are not available in sufficient numbers in the present workforce.
2. Changes in technology, methods, or required behaviors have caused current skills to be obsolete.
3. Economic restructuring requires workers to move from one occupation to another.
4. Unemployment rates are high.
5. Parts of a population are not able to obtain employment in order to support themselves.

Commentary

The only valid result of training activity is a measurable increase or improvement in an individual's contribution to the goals of an organization. Thus, the trained behavior must not only be observable and measurable, it must also be transferred to the job. Training is a means toward an end. The end is an improvement in the organization's ability to meet its goals. The basic purpose of training is to shape or reshape the behavioral pattern of an individual. The desired function of a trainer (or training system) is to provide and manage the experiences in which learning can take place.

Note. None of the numbered lists on this Information Sheet were sequenced in a methodological order. Their arrangement merely reflects an effort to present items logically.

Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Information Sheet

THE IMPACT OF A TRAINING EXPERIENCE

Training should be considered in light of an individual's prior experience and the behaviors which must be developed in the present or proposed environment. When a need for training exists, those responsible for instruction must be aware that the trainee does not arrive at the training situation needing to learn everything. A part of the behaviors (knowledge, skills, and attitudes) necessary to do the job will have been previously learned. In fact, everything trainees learn during the training experience will form only a part of their total "experience bank," no matter how comprehensive the particular course or program is. This point is illustrated by the formula: **M - I = D**. In this equation, **M** signifies Mastery of all necessary behaviors, and **I** represents Inventory of existing behaviors. **D** then represents Deficiency or training need.

The "Training Fraction" shown below provides an indicator of the impact any training experience will have on an individual's total experience. The fraction indicates that the training experience forms only a small part of an individual's total experience — experience accumulated over 16 waking hours a day, 365 days a year, each year of their life. For someone 45 years of age, the impact of a one-week (40-hour) training experience would be:

$$\boxed{\frac{\text{Hours Devoted to Training}}{(16) \times (365) \times (\text{Age in Years})}} \quad \frac{40}{(16) \times (365) \times (45)} = \frac{40}{262{,}800} = .00015$$

of the trainee's total life experience

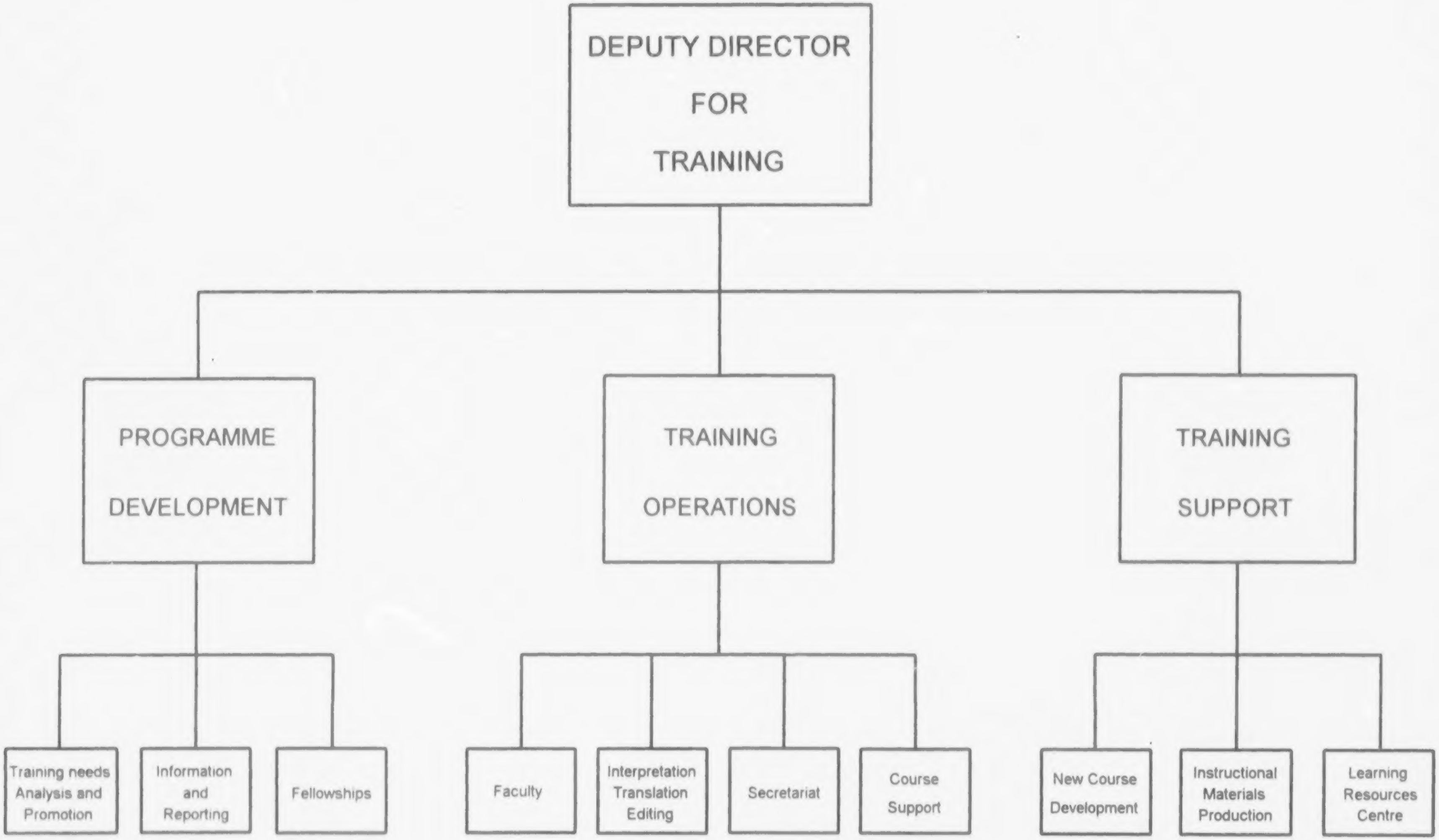
The training fraction attempts to make two points:

1. Do not be overly optimistic about what any single training experience can produce in the way of behavioral change. (In the above example, the 40 hours devoted to training represented only .00015 of the trainee's total life experience.)
2. The training experience must be so meaningful that it exerts an impact which overcomes its relatively brief timespan.

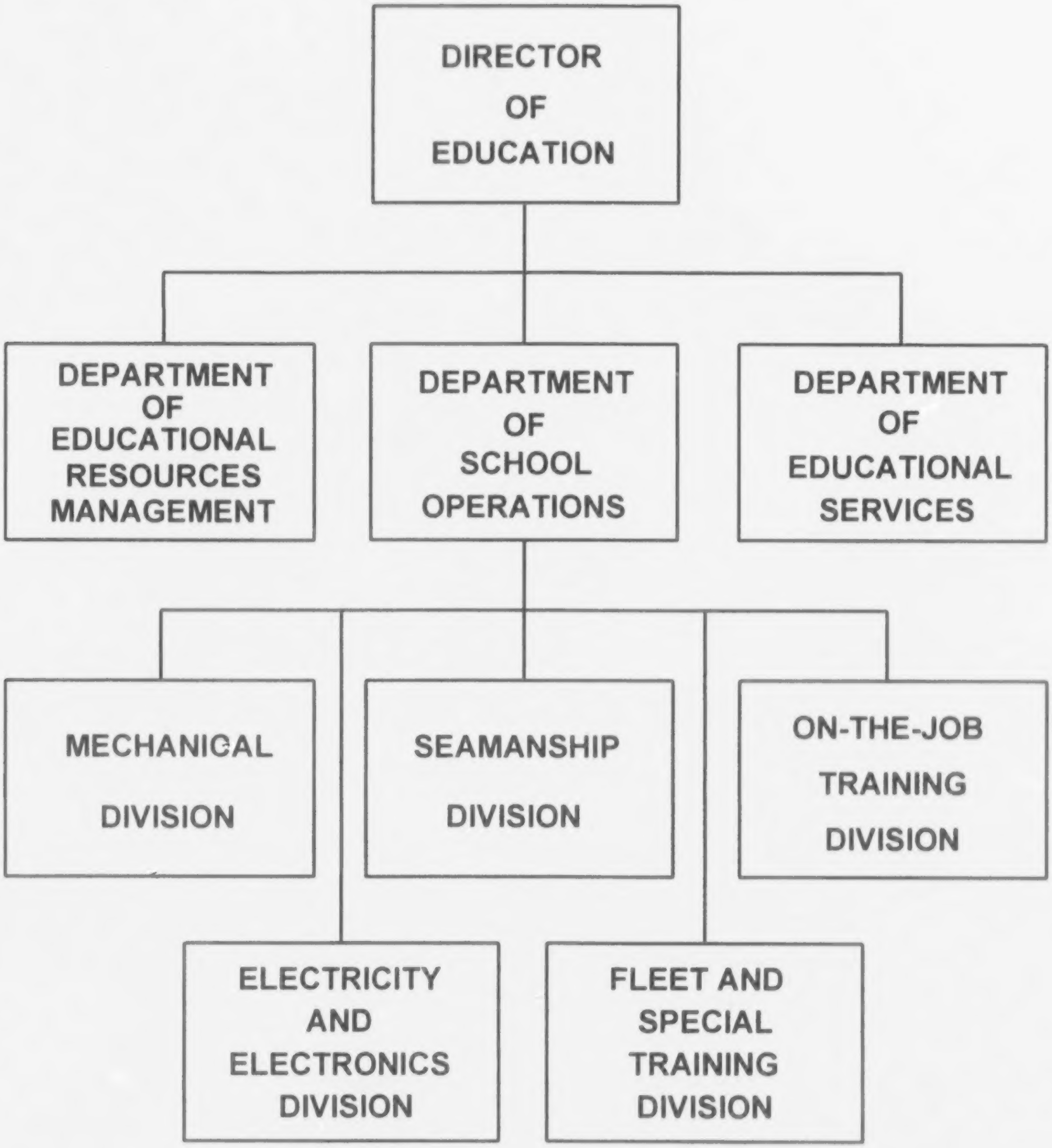
C^{2}99

ORGANISATION CHART

Training Department, International Centre for Advanced Technical and Vocational Training


DEPUTY DIRECTOR FOR TRAINING
PROGRAMME DEVELOPMENT
TRAINING OPERATIONS
TRAINING SUPPORT
Training needs Analysis and Promotion
Information and Reporting
Fellowships
Faculty
Interpretation Translation Editing
Secretariat
Course Support
New Course Development
Instructional Materials Production
Learning Resources Centre

JUBAIL TRAINING CENTER


DIRECTOR OF EDUCATION
DEPARTMENT OF EDUCATIONAL RESOURCES MANAGEMENT
DEPARTMENT OF SCHOOL OPERATIONS
DEPARTMENT OF EDUCATIONAL SERVICES
MECHANICAL DIVISION
SEAMANSHIP DIVISION
ON-THE-JOB TRAINING DIVISION
ELECTRICITY AND ELECTRONICS DIVISION
FLEET AND SPECIAL TRAINING DIVISION

Human Resource Development Department

The University of Tennessee
Information Sheet

TRAINING POLICY ANALYSIS

1. Axioms
2. Key terms
3. A definition
4. What to look for
5. Relevance, effectiveness, and efficiency
6. Basic steps
7. Financial options
8. Study the demand side
9. Demand-side issues
10. Study the supply side
11. Supply-side issues
12. Gathering information
13. Training questions
14. Comparing education and training

Note. Parts of this work are based on personal communications with W. Durr, International Labour Office, Geneva, Switzerland.

Clifton P. Campbell

Axioms

Societies seek economic and social development.

Development depends on, among other things, people with useful knowledge, skills, and attitudes — and therefore on training.

Countries need to formulate policies, including training policies, to meet economic and social development objectives.

Three training policy ingredients:

1. Program orientation
2. Resource allocation
3. Institutional arrangements

Policy formulation is one thing; implementation is another. Realistic polices must therefore recognize a variety of constraints; moreover, they must indicate priorities.

Key Terms

Policy:
A course of action by which it is proposed to achieve a certain objective, notably in government.

Development:
A process of economic and social change typically fueled by income growth.

Training:
An effort organized to transfer knowledge, skills, and attitudes which people need in order to be productive or to change their working behavior.

System:
A set of things, parts, ideas, that work together or form a whole, e.g. training policies, programs, resources, and institutions.

Analysis:
Separation into parts, e.g. the unraveling of a system to know how it works or what is wrong with it.

A Definition

Training Policy Analysis is a process of inquiry aimed at recommending how training delivery systems can be made more (a) relevant, (b) effective, and (c) efficient.

in other words,

Training Policy Analysis is an intellectual effort to decide:

where we stand; what is the problem; what is the solution; where we want to go; how best to get there given the circumstances, context, environment, i.e. the constraints and opportunities, the distance, time at our disposal, and given other, wider objectives.

What To Look For

Relevance:

The extent to which training objectives correspond to objectives, needs, and priorities beyond the training system, notably economic growth and social development.

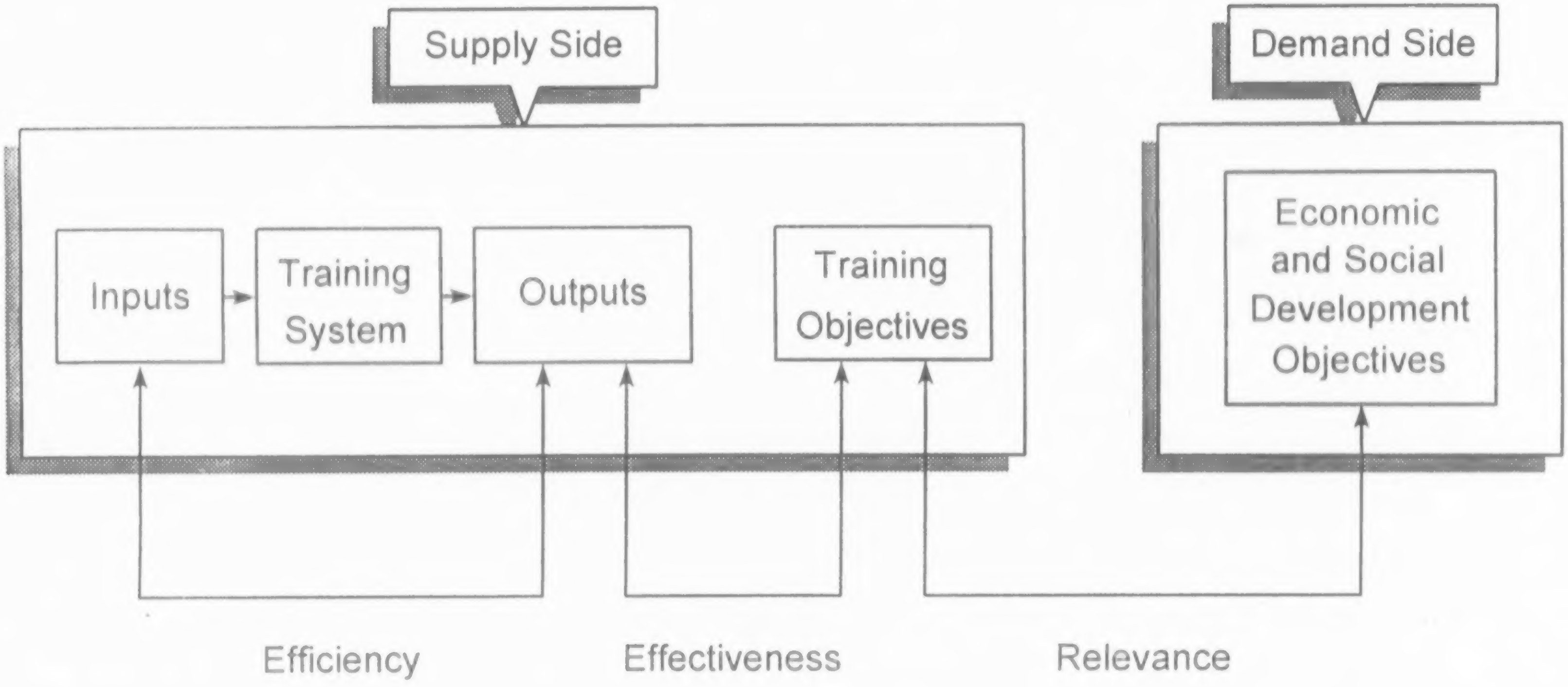
Effectiveness:

The extent to which outputs of the training system correspond to what was intended, i.e. to training objectives.

Efficiency:

The relationship between outputs and inputs; the product of efforts to reduce inputs for given outputs or increase outputs for given inputs. Producing the desired result with a minimum of expense and waste.

Training Policy Analysis: Relevance, Effectiveness, and Efficiency



Supply Side

Inputs

Training System

Outputs

Training Objectives

Demand Side

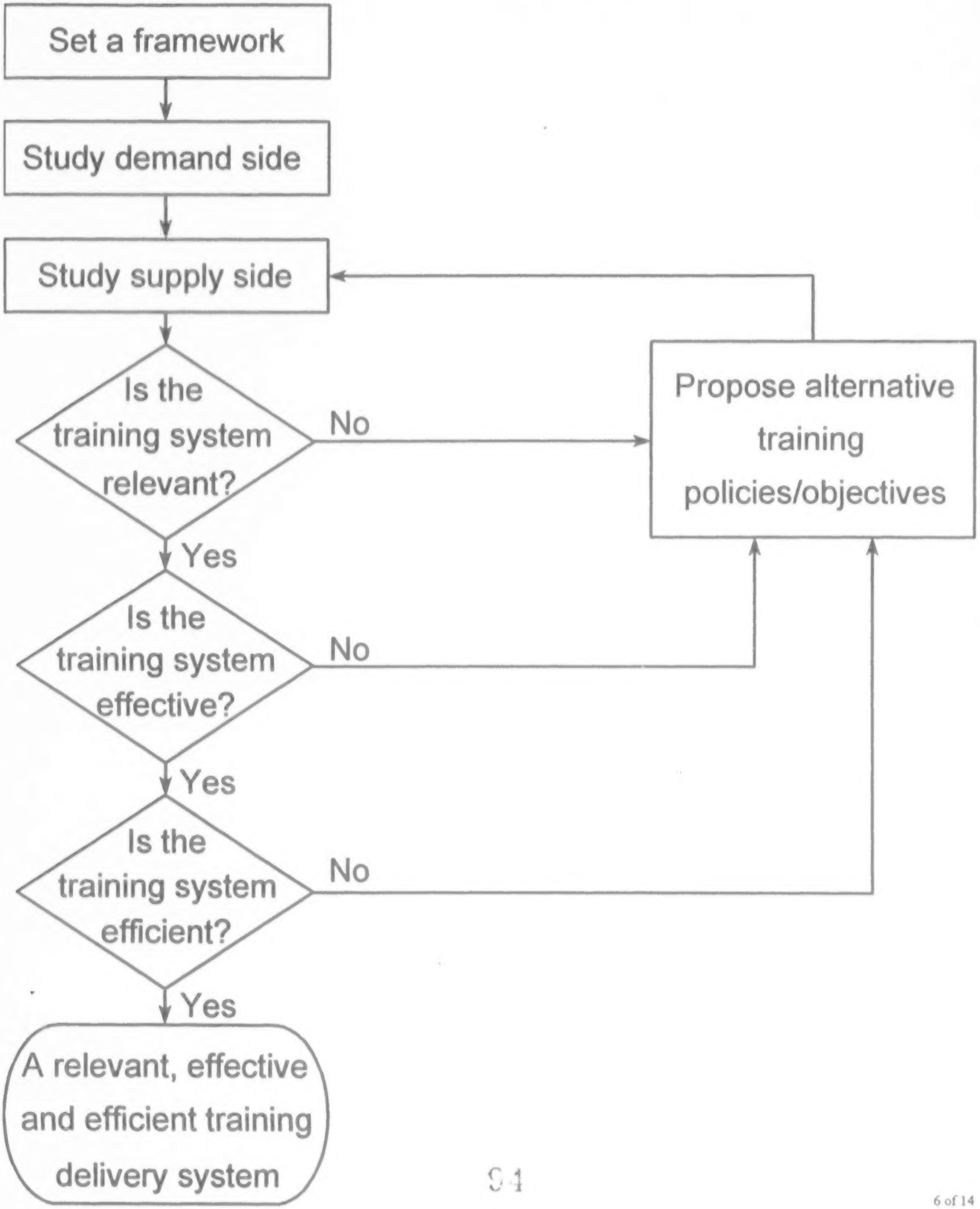
Economic and Social Development Objectives

Efficiency

Effectiveness

Relevance

Training Policy Analysis: Basic Steps



Set a framework

Study demand side

Study supply side

Is the training system relevant?

No

Yes

Propose alternative training policies/objectives

Is the training system effective?

No

Yes

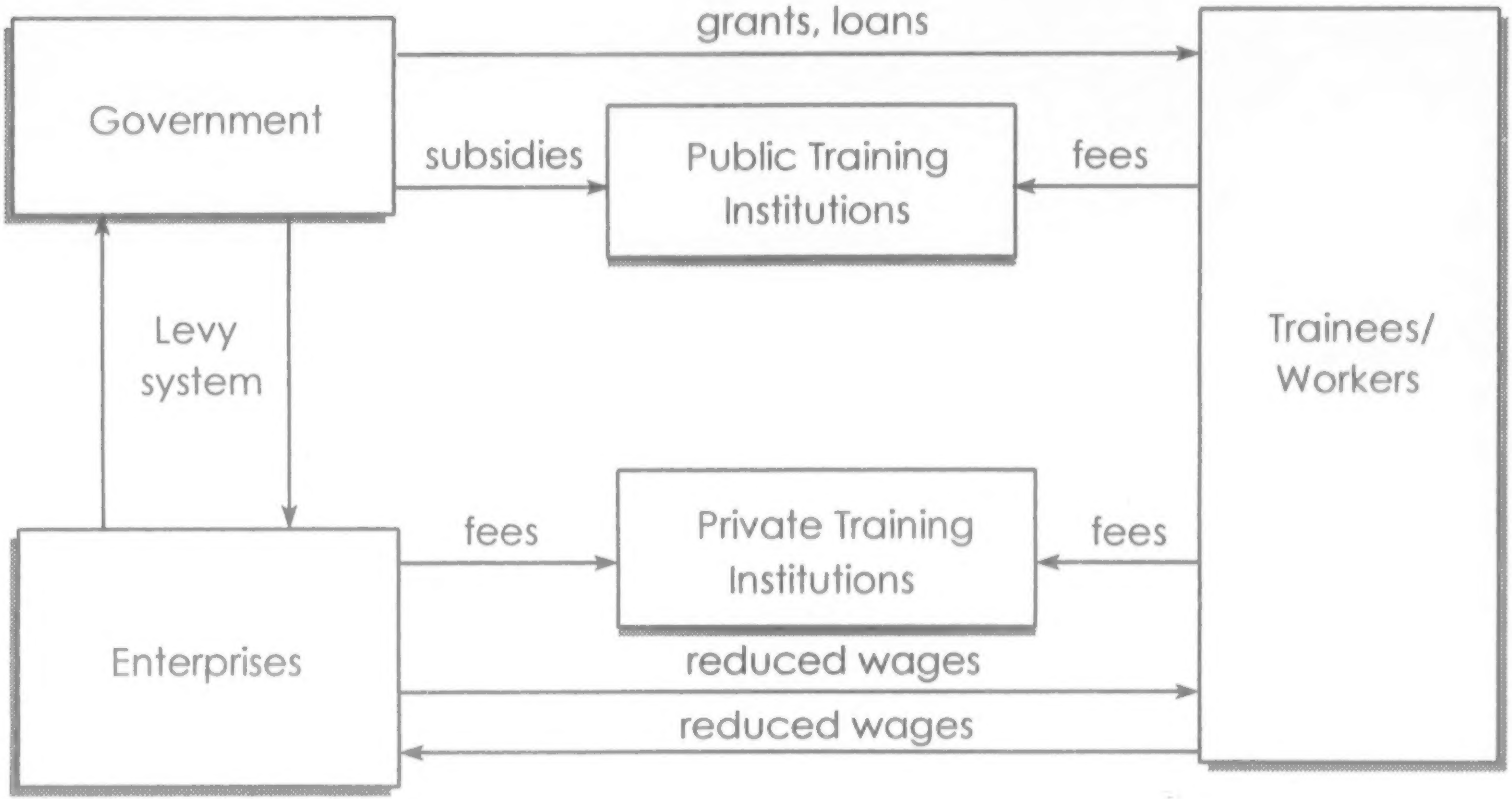
Is the training system efficient?

No

Yes

A relevant, effective and efficient training delivery system

Training Policy Analysis: Financial Options



Government

Public Training Institutions

Private Training Institutions

Enterprises

Trainees/ Workers

grants, loans

subsidies

fees

Levy system

fees

fees

reduced wages

reduced wages

STUDY THE DEMAND SIDE

Q: What should the training system do? For whom?

1. Recognize the national context
2. Identify current national training objectives
3. Summarize current development objectives
4. Establish current and future labor market demand (need) for skilled workers
5. Establish social demand for training

DEMAND SIDE ISSUES

1. Demand, need, opportunity, feasibility
2. Appropriate and inappropriate training objectives
3. How specific can one get, should one get

STUDY THE SUPPLY SIDE

Q: What is the training system? What does it do? What is it capable of doing?

1. Size of the system
2. Breadth and depth of coverage
3. Standards and pass rates
4. Training costs
5. Personnel
6. Facilities, equipment, materials

SUPPLY SIDE ISSUES

1. Division of labor
2. Capacity
3. Capability
4. Targeting
5. Trainability
6. Standards & testing
7. Follow-up

Gathering Information

on the demand side:

1. Workforce Projection and Forecasting Approaches
   - Manpower requirements approach
   - Econometric models
   - Input-output models
2. Labor Market Signalling Approaches
   - Reporting by employment services
   - Employer surveys
   - Key informant interviews
   - Analysis of job advertisements
   - Follow-up studies

on the supply side:

- Enrollment data
- School visits
- Follow-up studies
- Labor turnover surveys

Training Questions

WHY
should people be trained?

WHO
should be trained? How many? Who should be trained first?

HOW
is training best organized, managed, and financed? Who does what?

WHAT
should people learn? How is this determined and assessed? How about standards?

HOW
is training best delivered? By whom? Where? When?

Human Resource Development: Comparing Education and Training

Human Resource Development

Education

1. Learning to be someone
2. Developing personality
3. Career-related
4. Concepts and rules
5. Learning why
6. Fixed costs: mixed results

Training

1. Learning to do something
2. Developing specific skills
3. Job-related
4. Facts and procedures
5. Learning how
6. Fixed result: minimize costs

SELECTION AND DEVELOPMENT OF THE TRAINING STAFF

Directions: Each of the following items contains four (4) alternatives, one of which provides the **best answer**. Circle the letter which precedes the best answer.

NOTES

1. When an organization selects internal candidates to join the training staff, managers should

   A. select only those who are subject matter experts with long experience.
   B. invest the resources needed for new trainers to develop essential job skills.
   C. choose those who need no further training to perform their new duties.
   D. make sure first that no qualified people are available from outside the organization.

2. The first step in filling a training position is to

   A. publicize the vacancy.
   B. inform employment agencies of the opening.
   C. contact professional organizations.
   D. specify the job requirements.

3. When a candidate selected for a training position is deficient in knowledge, skills, or other selection criteria, the best thing for the training manager to do is

   A. invest in the necessary training and development.
   B. redefine the job specifications.
   C. change the selection criteria for future positions.
   D. reduce the job performance requirements.

4. Developing career paths for members of the training staff should

   A. have as little effect on organizational goals as possible.
   B. be based entirely on the needs of the organization.
   C. combine the needs of the organization with the personal growth goals of employees.
   D. mainly be left up to the individual employees.

COMPETENCY ANALYSIS FOR TRAINERS

Table 1 COMPETENCY/FUNCTION

COMPETENCY AREA	TRAINING AND DEVELOPMENT FUNCTION				
	INSTRUCTOR	DESIGNER	MANAGER	CONSULTANT	INDEX
1. ADMINISTRATION	○	○	●	◐	7
2. COMMUNICATIONS	●	●	●	●	10
► 3. COURSE DESIGN	◐	●	○	●	12
4. EVALUATION	●	●	●	●	14
5. GROUP DYNAMICS/PROCESS	●	●	○	●	16
► 6. INSTRUCTIONAL TECHNIQUES	●	◐	○	●	18
7. LEARNING THEORY	◐	●	○	●	23
8. MANPOWER PLANNING	N/A	N/A	◐	◐	25
9. PERSON/ORGANIZATION INTERFACE	◐	○	●	●	27
10. RESEARCH & DEVELOPMENT	○	●	○	●	29
11. TRAINING EQUIPMENT & MATERIALS	●	●	○	●	31
12. TRAINING-NEEDS ANALYSIS	○	◐	●	●	35

PROFICIENCY LEVELS:
● HIGH [must] level ◐ MEDIUM [want] level ○ LOW level N/A Not Applicable

In the detailed "Area of Competency" skill lists within the main part of the document, only the highest level is designated. This is the "must" or "survival" skill which is absolutely essential to performance success. While the absolute requirements can and will vary from position to position, those identified as "survival" needs will be found to be correct in the majority of cases.

HOW TO USE THIS DOCUMENT

The following steps indicate how to make the most effective use of *Competency Analysis:*

1. Select the T & D function to be analysed from Table 1 (see above)
2. Reading down the Competency Area column, identify the particular competency area to be studied. Note the page number under the Index column and turn to that page for the detailed list of competencies.
3. Review the detailed list of types of knowledge and skills[1] for the particular competency area selected. Of greatest importance are those items identified as "survival" needs (●) beneath the column representing your particular T & D role.[2]
4. Consider each skill listed with regard to whether or not it is required in your own unique position or organization. If the skill is not needed, enter an X in the column headed N/A (not applicable).[3]
5. Now consider any unique skills or knowledge areas which are demanded by your position or company and which are not included in the list. Enter these skills on the blank lines provided at the bottom of each list.[4] Be sure to indicate the proficiency level for any skills added.
6. There are two competency rating columns at the right side of the page. The first of these is titled PERSON[5] and is to be used to rate the competency skill level of the incumbent of the position under analysis. Consider each skill and rate the incumbent accordingly. Use a scale of 0 (no competence) to 5 (high competence).
7. The second column at the right is titled JOB[6] and relates to the significance of the skill for the successful execution of the job to be analysed. Use the same 0 to 5 scale in this column.
8. Once both the person and the job have been rated, subtract the rating under JOB from the rating under PERSON and plot the variance in the PERSON/JOB VARIANCE column.[7] Be sure to maintain consistency in calculating the variances; that is, always subtract the job rating from that given the person. Because the scale is calibrated to both a plus (+) and a minus (−) extreme, individual strengths and weaknesses may be visually identified by simply noting the plotted results on the appropriate side of the scale.

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WHO SHOULD USE THIS DOCUMENT

Because of its flexibility and broad application, *Competency Analysis* will be useful across the entire T & D spectrum.

- **NOVICE PRACTITIONERS** Those who are new to the T & D role can use *Competency Analysis* to assess their performance readiness and to establish personal development plans.
- **EXPERIENCED PRACTITIONERS** Those who are settled into their particular position may employ *Competency Analysis* to further enhance their skills, monitor their performance, and plan their careers.
- **CAREER PROFESSIONALS** Established T & D professionals may employ *Competency Analysis* for self-evaluation and career planning. The document also provides them with a constant checklist against which to judge their knowledge and skills with respect to changing demands or emphases of job performance.
- **MANAGERS** Those who supervise T & D professionals may employ *Competency Analysis* to recruit, evaluate, coach, and counsel subordinates. By using the document to reach mutual agreement about criteria for measuring job performance, evaluation and counselling sessions will become more productive and less likely to develop into adversarial confrontations.
- **T & D ASPIRANTS** Individuals who seek careers in T & D will find *Competency Analysis* useful for assessing their opportunities and preparing for their entry into the professional stream.
- **COURSE DESIGNERS** Those who are designing programs for the instruction of T & D practitioners may use *Competency Analysis* to ensure appropriate content and subject emphasis.

APPLICATIONS

Competency Analysis offers a variety of applications which, of course, may be modified according to individual need.

- CANDIDATE SELECTION MODEL Using Table 1 (p. 2), personnel officers can establish position models against which available candidates for a T & D job can be compared. This model can be expanded to a full position profile by referring to the corresponding detailed knowledge/skill lists. (Use steps 1 to 5 under "How to Use This Document".)
- SELF-ASSESSMENT An individual may assess his or her knowledge/skill level against current position criteria. (Use steps 1 to 8 under "How to Use This Document".)
- DEVELOPMENT PLANNING From the method of assessment described above, a specific development plan may be established to address knowledge/skill shortfalls.
- PERFORMANCE TRACKING Repeated use of this method of assessment will reveal the amount of progress or improvement achieved over time.
- PERFORMANCE EVALUATION Managers of T & D professionals may evaluate performance through the assessment approach described above. Areas of knowledge/skill requiring coaching and/or counselling will become readily apparent.
- POSITION/JOB DESCRIPTIONS Accurate and detailed job descriptions will result from employing the model described above.
- CAREER PLANNING A detailed assessment, as described in "Self-Assessment" above, will reveal individual strengths and areas needing improvement. Comparison of the results with the criteria for other T & D functions identifies the areas of knowledge/skill that require development and enables the individual to develop a realistic plan for advancing in his or her career. (See "Personal Planning Guide" at the end of this document.)
- CURRICULUM OR COURSE CONTENT By employing steps 1 to 5 under "How to Use This Document", a course designer may readily identify the required subject content in a training program for T & D practitioners. If pre-course testing takes place, the course designer can carry the process through to step 8 to determine which subjects require major emphasis and which can be dealt with briefly.

DIAGNOSTIC COMMENTS

The following may prove helpful in interpreting the variances obtained after rating both the job and the job incumbent:

- When the job rating exceeds that of the person rating by 1 and the person rating is 2 or more, the shortfall is not serious and can be given low priority in the resulting development plan.
- When the job rating exceeds that of the person rating by 1 and the person rating is 0 or 1, the skill should receive moderate to high priority depending upon the seriousness of other skill shortfalls.
- When the job rating exceeds that of the person rating by 2 and the person rating is 2 or 3, the skill should receive moderate priority in any resulting development plan.

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- When the job rating is 3 or more points higher than the person rating, the shortfall is serious and should receive priority attention.
- Any variance favouring the job where the person rating is 0 is serious and should receive priority attention in any resulting development plan.
- When the person rating exceeds that of the job by 3 or more, the person should be alert to a possible resulting performance problem. Individuals tend to rely upon those skills in which they are proficient to the extent that over-use has a negative effect. Any T & D professional who, upon using *Competency Analysis*, discovers highly rated skills which appear to be of little or no value to the job should be cautioned against their excessive use. Very often, one's most severe performance drawbacks are merely the result of one's overdeveloped strengths.
- When the amount by which the job rating exceeds or falls below the person rating is erratic – that is, ranges widely in the degrees of variance – the person should concentrate his or her development plan upon achieving some kind of consistency. Failure to do this may result either in a performance in which weaknesses seem greater when juxtaposed with major strengths, or in awkwardness as a result of the person's attempts to avoid using weak skills entirely. If *Competency Analysis* has been completed fairly and objectively and a skill is identified as essential to the job, its use cannot be avoided. *Balanced performance from a T & D professional is far superior to a performance highlighted by erratic highs and lows.*

It is extremely difficult for individuals to be entirely objective about themselves or their jobs. Because of this, it is recommended that the skill analysis be carried out by two people: the individual being analyzed and, if possible, his or her direct superior. Points of major difference can be discussed for agreement, or it may be agreed at the outset that an average of the two ratings will be taken. This practice produces more objective results and helps to clarify the performance expectations of the two people involved.

Source:

Ontario Society for Training and Development. (1984). Competency analysis for trainers: a personal planning guide. Toronto, Ontario, Canada: Author.

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AREA OF COMPETENCY: COURSE DESIGN (cont'd.)

I	D	M	C
◐	●	○	●

OVER-ALL COMPETENCY PRIORITY

I	D	M	C	SKILL IN:	N/A	COMPETENCY RATING PERSON/JOB	PERSON/JOB VARIANCE − 5 3 0 3 + 5
	●		●	Developing training materials (e.g., workbooks, exercises, etc.)			
	●		●	Describing appropriate learning environment for program (type of organization, facilities, etc.)			
	●		●	Preparing and adapting lesson plans			
	●		●	Developing "typical participant" profiles			
	●		●	Developing criteria for selecting program participants			
	●		●	Developing evaluation criteria for both program and participants			
	●		●	Interpreting statements of organization self-image, etc.			
	●		●	Tailoring program content to client needs			
	●		●	Selecting appropriate instructional methods (e.g., videotape, role playing, demonstration, etc.)			
	●		●	Preparing scripts for films, videotapes, etc.			
	●		●	Developing programmed-learning or computer-managed instructional materials			
	●		●	Determining program structure (length, number of participants, choice of techniques, etc.)			
	●		●	Determining appropriate sequences of courses and programs (e.g., prerequisites, curricula)			
	●		●	Developing self-assessment tools (e.g., checklists, manuals, exercises)			
	●		●	Revising materials/programs based on evaluation feedback			
	●		●	Securing necessary copyrights or reprint permissions			
	●		●	Interpreting training-needs analysis			

(● = Survival Level Requirement)

Instructor Designer Manager Consultant

AREA OF COMPETENCY: COURSE DESIGN

I	D	M	C
◐	●	○	●

OVER-ALL COMPETENCY PRIORITY

I	D	M	C		N/A	COMPETENCY RATING PERSON/JOB	PERSON/JOB VARIANCE –5 3 0 3 +5
				KNOWLEDGE AND UNDERSTANDING OF:			
	●	●	●	Available courses and programs			
	●		●	Recognized theory (theories) of course-design techniques			
	●	●	●	Modern learning theories			
	●		●	Characteristics, advantages, and disadvantages of major instructional methodologies			
	●		●	Group dynamics			
	●		●	Different approaches to designing, implementing, and evaluating learning and learning systems			
	●		●	Design and production of programmed-instruction programs			
				SKILL IN:			
	●		●	Implementing and validating pilot training programs			
	●		●	Identifying and setting program objectives			
	●		●	Applying adult learning theory and instructional principles in developing program content and material			
	●		●	Identifying and utilizing internal/external resources (books, consultants, etc.) required for course design			
	●		●	Selecting and developing support materials (audio-visual materials, etc.)			

(● = Survival Level Requirement)

AREA OF COMPETENCY: INSTRUCTIONAL TECHNIQUES

Instructor / Designer / Manager / Consultant

I	D	M	C	
●	◐	○	●	OVER-ALL COMPETENCY PRIORITY

I	D	M	C		N/A	COMPETENCY RATING PERSON/JOB	PERSON/JOB VARIANCE −5 3 0 3 +5
				KNOWLEDGE AND UNDERSTANDING OF:			
				Methods of instruction such as:			
●	●		●	(a) Brainstorming sessions			
●	●		●	(b) Buzz groups			
●	●		●	(c) Case studies			
●	●		●	(d) Critical incident processes			
●	●		●	(e) Demonstrations			
●	●		●	(f) Discovery (developmental) techniques			
●	●		●	(g) Discussion groups			
●	●		●	(h) Use of the in-basket			
●	●		●	(i) Lectures			
●	●		●	(j) Problem-solving exercises			
●	●		●	(k) Programmed-instruction exercises			
●	●		●	(l) Role playing			
●	●		●	(m) Simulation exercises			
●	●		●	(n) Tutoring (coaching/counselling)			
				Instructional processes such as:			
●	●		●	(a) Apprenticeship programs			
●	●		●	(b) A/V-assisted instruction			

(● = Survival Level Requirement)

AREA OF COMPETENCY: INSTRUCTIONAL TECHNIQUES (cont'd.)

Instructor Designer Manager Consultant

I	D	M	C	
●	◐	○	●	OVER-ALL COMPETENCY PRIORITY

I	D	M	C		N/A	COMPETENCY RATING PERSON/JOB	PERSON/JOB VARIANCE − 5 3 0 3 + 5
				KNOWLEDGE AND UNDERSTANDING OF:			
●	●		●	(c) Computer-assisted instruction			
●	●		●	(d) Contingency-planning exercises			
●	●		●	(e) Learning by correspondence			
●	●		●	(f) On-the-job training			
●	●		●	(g) Participation			
●	●		●	(h) Self-instruction			
●	●		●	(i) Telephone-assisted instruction			
●	●	●	●	Instructional objectives (purpose and format)			
●	●		●	Lesson planning (format and use)			
●	●		●	Observers and how to use them			
●			●	Positive-reinforcement techniques			
●	●		●	Subject matter			
●	●	●	●	Social factors in training processes			
				Origins of: (a) Apprenticeship training			
				(b) Classroom education			
				(c) Occupational training			

(● = Survival Level Requirement)

AREA OF COMPETENCY: INSTRUCTIONAL TECHNIQUES (cont'd.)

Instructor
Designer
Manager
Consultant

I	D	M	C	
●	◐	○	●	OVER-ALL COMPETENCY PRIORITY

I	D	M	C		N/A	COMPETENCY RATING PERSON/JOB	PERSON/JOB VARIANCE – 5 3 0 3 + 5
				KNOWLEDGE AND UNDERSTANDING OF:			
●	●		●	Motivation (theories, models, research)			
				SKILL IN: Using various methods of instruction such as:			
●			●	(a) Brainstorming sessions			
●			●	(b) Buzz groups			
●			●	(c) Case studies			
●			●	(d) Critical incident processes			
●			●	(e) Demonstrations			
●			●	(f) Discovery (developmental) techniques			
●			●	(g) Discussion groups			
●			●	(h) Use of the in-basket			
●			●	(i) Lectures			
●			●	(j) Problem-solving exercises			
●			●	(k) Programmed-instruction exercises			
●			●	(l) Role playing			
●			●	(m) Simulation exercises			
●			●	(n) Tutoring (coaching/counselling)			

(● = Survival Level Requirement)

AREA OF COMPETENCY: INSTRUCTIONAL TECHNIQUES (cont'd.)

Instructor Designer Manager Consultant

I	D	M	C
●	◐	○	●

OVER-ALL COMPETENCY PRIORITY

I	D	M	C	SKILL IN:	N/A	COMPETENCY RATING PERSON/JOB	PERSON/JOB VARIANCE −5 3 0 3 +5
				Using various instructional processes such as:			
●			●	(a) Apprenticeship programs			
●			●	(b) A/V-assisted instruction			
●			●	(c) Computer-assisted instruction			
●			●	(d) Contingency-planning exercises			
●			●	(e) Learning by correspondence			
●			●	(f) On-the-job training			
●			●	(g) Participation			
●			●	(h) Self-instruction			
●			●	(i) Telephone-assisted instruction			
●	●		●	Preparing instructional objectives			
●	●		●	Preparing lesson plans			
●			●	Effectively using observers			
●			●	Using positive reinforcement techniques			

(● = Survival Level Requirement)

AREA OF COMPETENCY: INSTRUCTIONAL TECHNIQUES (cont'd.)

Instructor Designer Manager Consultant

I	D	M	C	
●	◐	○	●	OVER-ALL COMPETENCY PRIORITY

I	D	M	C	SKILL IN:	N/A	COMPETENCY RATING PERSON/JOB	PERSON/JOB VARIANCE – 5 3 0 3 + 5
●			●	Effectively managing classroom time			
●			●	Effectively using physical behaviour in instructing			
●			●	Effectively using voice in instructing			
●			●	Effectively using proper attitudes in instructing			
			●	Using behaviour-modelling techniques			
●		●	●	Instructing managers and supervisors in how to train			

(● = Survival Level Requirement)

DETERMINING THE DEMAND FOR SKILLED WORKERS

Learning Objectives

Upon successful completion of this module, you will be able to:

1. Name and describe important aspects of three workforce projection and forecasting approaches
2. Differentiate among the workforce projection and forecasting approaches
3. Name and describe important aspects of five labor market signalling approaches
4. Differentiate among the labor market signalling approaches
5. Assess inputs and judge the value of the information provided by the different approaches for determining skilled worker demands
6. Prepare a questionnaire for use in a follow-up study
7. Pilot-test the questionnaire on a sample of trainees and make all appropriate revisions

Rationale (purpose)

To provide information on different approaches used in determining labor market demand (number of workers needed with particular skills). This demand information is important for planning vocational education and training (VET) that is relevant to the skilled worker needs of the local, regional, and national economy.

Introduction

This module provides an overview of the main methods and techniques relied upon to determine the demand for skilled workers. These are the (a) workforce projection and forecasting approaches, and (b) labor market signalling approaches.

It is widely agreed that VET opportunities ought to closely match the need for workers with particular skills. However, current and future skilled worker needs are not easily and precisely determined. Profiles of job and skill requirements are a consequence of the changes taking place in technology, work organization, consumer patterns, and the restructuring of the world-wide economic system (Campbell, 1996, chap. 1).

Even though experts question the utility and validity of projecting or forecasting long-term national skilled workforce demands in a free-market economy, public agencies and research institutions as well as private consulting firms continue the practice. This is largely because decisions need to be made about the utilization of existing and the availability of new training facilities and faculty, the number of trainees to be admitted to different courses/programs, and so forth, in advance of labor market entry by those who are to be trained. The longer the training period, the greater the need to plan ahead of labor market demand (Lauglo, 1993, p. 8).

In response to criticism, projections and forecasts are now largely confined to a sectoral or regional level, where they are more apt to provide useful information. The trend is toward collecting more valid and reliable information for short-term projections and forecasts, which tend to be more accurate, and making adjustments based on routine monitoring through generally accepted labor market signalling approaches.

Organization of the module. This module is organized in three parts. The first part presents **workforce projection and forecasting approaches**. Three approaches are briefly described and the salient advantages and disadvantages are pointed out in text and listed in Table 1. In addition, three other approaches are identified. Table 1 is followed by a progress check, to facilitate your understanding of the content covered and to promote learning.

Part 2 of the module exhibits five **labor market signalling approaches**. A description is provided for each approach and the advantages and disadvantages are pointed out in text and listed in Table 2. This is followed by Table 3, which rates each approach against the maximum potential value of the various categories of information it collects. Like Part 1, there is a progress check, to facilitate a review of the content covered in order to promote learning.

Part 3 begins with **a comment** — a series of remarks and observations pertaining to Parts 1 and 2 of this module. This is followed by three **supplemental instruments** which provide information, examples, and guidance relative to determining workforce demand. They are titled:

1. An example of the organization and analysis of key informant interviews
2. Guidelines for conducting follow-up studies
3. A prototype follow-up questionnaire

Progress checks 3A and 3B are included in this last part of the module. They are intended to facilitate your understanding of significant content and promote learning.

A note on terminology. It is important at this point to clarify three often-used words: projection, forecasting, and planning. Each of these words has a specific meaning; nevertheless, the words projection and forecast are often used interchangeably in the literature.

Projection is a protraction in the future of a past trend, in accordance with assumptions of extrapolation or deviation. The approaches used are mechanical and are not based on any explicit formulation of how labor markets function. Projections are not forecasts unless they involve a probability.

Forecasting is to make an assessment of what will happen between the present (base year) and a future date (target year). The time period is a major consideration. Assessments are usually quantified, made with a certain degree of confidence in their probability, and subject to assumptions concerning the nature and direction of future trends. Assumptions are the backbone of the forecast.

Planning consists of conceiving a desired future and mobilizing the means to achieve it (Bertrand, 1992, chap. 7). For our purposes here, planning means anticipating and taking corrective action to avoid workforce imbalances (shortages and surpluses), based on the best possible information about current and future labor market demand. Thus, planning aids in the intelligent and effective preparation of human resources (Campbell, 1996, chap. 1).

Part 1 — Workforce Projection and Forecasting Approaches

The three workforce projection and forecasting approaches described here are the (a) manpower (workforce) requirements approach, (b) econometric models, and (c) input-output models. All three attempt to quantify the long-term future workforce demands of the economy.

Manpower (Workforce) Requirements Approach

The workforce requirements approach relates forecast or planned economic growth to the output of VET institutions (schools, institutes, colleges, apprenticeships, etc.) based on a number of plausible assumptions. A general assumption is that certain sectoral economic growth rates are reachable targets (Lauglo, 1993, p. 7). The workforce requirements derived from these targets can be used in planning the output of vocational institutions.

This approach, as usually practiced, has the following five main steps:

1. Forecast employment levels in the target year (some future date) for each economic sector/subsector
2. Estimate the distribution of various occupations (staffing patterns) in each sector/subsector
3. Convert the employment forecasts into a set of projections by occupation
4. Project occupational replacement needs — those arising from job turnover (retirements, disabilities, deaths, promotions, and occupational mobility)
5. Combine steps three and four for each occupation to estimate job (employment) possibilities

Advantages. The methodology is straightforward, transparent, and appeals to common sense. It is readily comprehensible and has remained popular with economists and policy-makers. Data requirements change according to variations of the model with regard to different levels of aggregation and detail. On the whole, however, data requirements are relatively modest. This approach provides long-term quantitative skilled worker requirements (Campbell, 1996, chap. 1).

Disadvantages. A set of evaluations of workforce requirements studies concluded that, while employment forecasts at the sectoral level (step 1 in the previous list) have been reasonably accurate, their conversion to occupations (step 3) is problematic (Hinchliffe, 1993). Furthermore, the reliability of this approach depends essentially on the accuracy of the plausible assumptions. Unfortunately, experience has shown that reliability remains an elusive goal; the discrepancy between actual and forecast workforce requirements is usually substantial (Mingat & Tan, 1988, p. 107). The reasons include weaknesses caused by overly-optimistic estimates of employment growth as well as increasingly rapid economic change. Other weaknesses are the frequent lack of allowance for technological advances, changing business practices, occupational mobility (e.g., resignations, layoffs, and discharges), and withdrawals from and returns to the workforce (e.g., quit to raise a child or pursue further education, then return). Additionally, jobs are often filled by those who lack the skills theoretically required but who will work for less.

As a rule, accuracy and reliability diminish with longer-term projections and with greater disaggregation, particularly greater occupational detail (Bertrand, 1992, chap. 1; Lauglo, 1993, p. 7). This dilemma is at the root of a general dissatisfaction by VET planners who insist that accurate training needs assessment requires detailed — rather than macro-type — projections.

Econometric Models

These models, which have undergone refinements since the 1960's, represent a set of equations describing the complex interrelationships of the different economic sectors. Econometric studies are a sophisticated long-term forecasting approach customarily conducted by economists. Their output is a set of estimates of levels of employment in various sectors for the target year (Bertrand, 1992, chap. 1). Users of this information are cautioned not to assume a straight-line trend between the base year (year of the study) and the target year. Econometric models are an alternative to the first step of the workforce requirements approach.

Advantages. This approach is sensitive to a large variety of factors affecting the level and structure of employment, taking into account indirect and local inter-sectoral effects. Methodological improvements allow for replacement needs to compensate for retirements, deaths, occupational mobility, and so forth.

Disadvantages. Data requirements, as well as model and data base maintenance costs, are considerable. In addition, due to the technical complexity of the model's documentation, the techniques applied pose problems of accessibility and comprehensibility to VET planners and policy-makers. Moreover, the data are national and, therefore, not entirely useful for regional or local planning.

Accuracy is also a problem with models which are based on projections of population, workforce, productivity, consumption, and overall output. This is because of the difficulty in forecasting economic activity, technological change related to productivity, and specific needs, which change due to labor and capital mobility in given market areas (American Institutes for Research, 1976, p. 45).

Input-Output Models

Like the econometric models just described, input-output models constitute the first step of the workforce requirements approach. Input-output models are used to construct a table that displays the exchange of goods and services among producing and purchasing industries over a set period of time. The industrial output is translated into employment demands within industries. Total employment within an industry is related to its total output and expressed in terms of a workforce input coefficient. These coefficients show the workforce requirements of an industry per unit of output (Bezdek, 1974, p. 3-13).

The following three steps characterize the input-output analysis:

1. A projection is made of the output of a particular industry. For example, mining — the tons of coal mined over the period of time desired.

2. A workforce coefficient — for example, one miner per 10,000 units of output — is applied to the absolute increase in production to arrive at an estimate of workforce requirements.

3. The projection and workforce coefficient are then translated into VET requirements (Mingat & Tan, 1988, p. 104).

Advantages. Input-output models are capable of producing highly detailed employment projections, taking into account inter-industry relationships. The models are equally appropriate for impact analysis (e.g., the effects of government programs on a regional economy).

Disadvantages. Development of a national input-output table is a complex, laborious, and expensive undertaking. First, a vast amount of quantitative information must be gathered from many and varied sources and then ordered. Next, an enormous amount of statistical compilation, estimation, correction, balancing, and reconciliation must be completed. Consequently, only organizations with specialists who have access to sophisticated computer capabilities can construct input-output tables.

Other Approaches

There are other workforce projection and forecasting approaches which are more or less appropriate to assessing future labor market demand. These include the **normative methods** which specify desired ratios (e.g., the number of practical nurses to registered nurses, apprentices to journeymen, etc.), the **international comparison method** (borrowing historical projection data from countries at more advanced levels of development), and the **rate of return analysis method** (instead of stipulating skilled worker requirements, it provides indicators for a necessary expansion or contraction of certain training courses and/or programs). The rate of return analysis method (model) also takes into account the cost of producing a given number of graduates.

Detailed descriptions of these three approaches, as well as the three previously presented, can be found in Training Needs Assessment and Monitoring by Lothar Richter (pp. 31-39), which also provides further references.

Note. The advantages and disadvantages of three workforce projection and forecasting approaches can be easily compared by consulting Table 1 on the following page.

Table 1. Advantages and Disadvantages of Workforce Projection and Forecasting Approaches

Advantages	Disadvantages
Manpower (workforce) requirements approach	
• Straightforward and transparent methodology appeals to common sense • Readily comprehensible • Popular with economists and policy-makers • Relatively modest data requirements • Provides long-term quantitative skilled worker requirements	• Conversion of sectoral-level forecasts to occupations is problematic • Reliability affected by uncontrollable factors, such as overly optimistic estimates of employment growth, rapid economic change, lack of allowance for technological advances, changing business practices, occupational mobility, and withdrawals from and returns to the workforce • Accuracy and reliability diminish with longer-term projections and with greater disaggregation
Econometric models	
• Sensitive to a large variety of factors which affect the level and structure of employment • Methodological improvements allow for replacement needs to compensate for retirements, deaths, occupational mobility, etc.	• Extensive data requirements • High data maintenance costs • Highly technical and, therefore, difficult for vocational training planners and policy-makers to access, comprehend, or use • National data not entirely useful for local or regional planning • Accuracy problem with models based on population, workforce, productivity, consumption, and overall output projections
Input-output models	
• Capable of producing highly detailed employment projections • Equally appropriate for short-term forecasting and impact analysis	• Complex, laborious, and expensive • Extensive data collection and manipulation requirements • Requires specialists and sophisticated computer capabilities

Progress Check -- Part 1 — Workforce Projection and Forecasting Approaches

Directions. Read each of the following items carefully and write in your answer. If you have difficulty with any of the items, go back and review the relevant content before continuing. Check your answers against those provided in the Progress Check Feedback at the end of this module.

1. List the three workforce projection and forecasting approaches described in Part 1.

   A. ______________________________

   B. ______________________________

   C. ______________________________

2. Identify the approach that relates forecast economic growth to the output of VET institutions. ______________________________

3. Name the reasons for the difficulty in accurately converting from sectoral/sub-sectoral to more specific occupational employment possibilities in the workforce requirements approach.

   A. ______________________________
   ____

   B. ______________________________
   ____

   C. ______________________________
   ____

   D. ______________________________
   ____

   E. ______________________________
   ____

   F. ______________________________
   ____

Progress Check -- **Part 1** (continued)

4. Identify two models that provide an alternative to the first step of the workforce requirements approach.

   A. ______________________________

   B. ______________________________

5. Name the workforce projection and forecasting approach that takes into account inter-industry relationships. ______________________________

6. Name the steps which characterize an input-output analysis.

   A. ______________________________

   B. ______________________________

   C. ______________________________

Part 2 — Labor Market Signalling Approaches

Rather than depend on sophisticated long-term projections and forecasts, with their difficulties and shortcomings, vocational training planners need to consider the merits of various labor market signalling approaches. The five approaches illustrated in Figure 1 involve the frequent collection and careful analysis of data on workforce supply and demand in local/regional labor markets. **Labor market signalling approaches identify current and short-term (future) job opportunities and can provide information on knowledge and skill requirements as well as employment practices.**

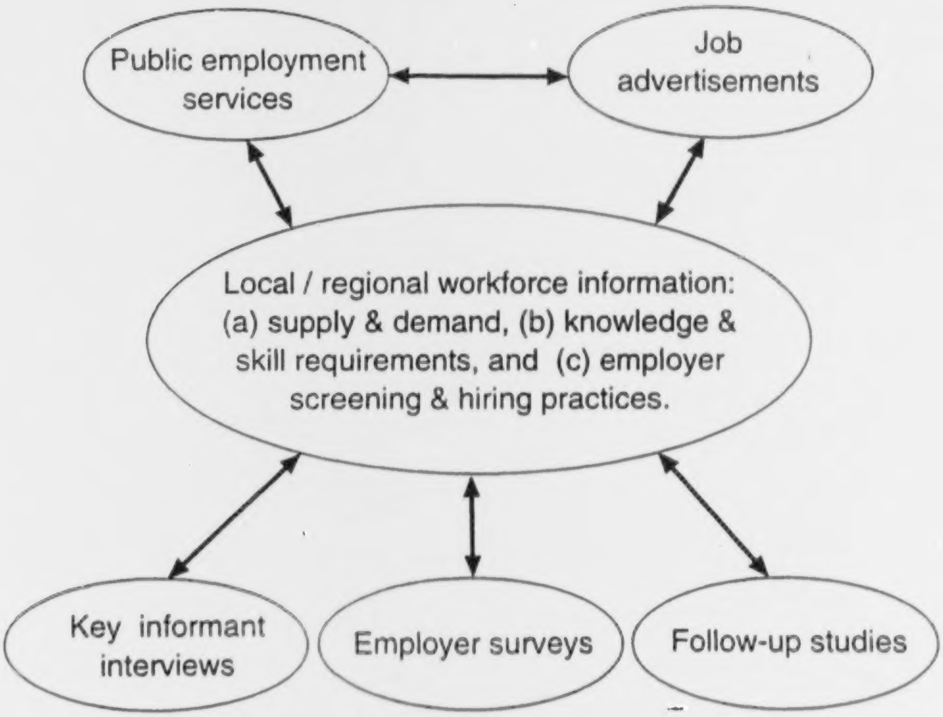
Public employment services
Job advertisements
Local / regional workforce information: (a) supply & demand, (b) knowledge & skill requirements, and (c) employer screening & hiring practices.
Key informant interviews
Employer surveys
Follow-up studies

Figure 1. Labor Market Signalling Approaches

Public Employment Services

Labor market signals can be captured by monitoring workforce movements in the employment and unemployment (layoffs and resignations) of workers. Most public (state) employment services collect and compile information on unemployment rates, job openings, and placements. Nevertheless, the data is seldom analyzed and few, if any, decisions are reached concerning present workforce requirements and labor supply or probable future requirements.

For example, tallying the number of openings, by job title, is not only useful in itself, but makes it possible (over time) to monitor trends in the demand for and supply of skilled workers. Thus, when job opening rates fall, unemployment rates rise, or employment growth declines for workers with particular skills, this signals a downturn in the need for these skills and, hence, in the benefits of providing training to produce them. There is a great and growing need for the information a public employment service could supply. However, such information must be available in a usable form (Campbell, 1996, chap. 1).

Advantages. Public employment services act as an intermediary between people seeking jobs and employers looking for qualified workers. Consequently, they are in touch with labor market happenings at local, regional, and state levels. As a result, they are in a position to (a) collect, compile, analyze, and report current information on job openings and unemployment rates; and (b) project future replacement and growth openings. This information is valuable to vocational training planners, who can use it in determining the need for training in a particular job or occupation. The analysis and dissemination of this information does not require investment of considerable new resources, but mainly requires broadening the focus to include labor market information analysis.

Disadvantages. Since the registration of people for unemployment benefits and the notification of vacancies (job order requests) by employers do not cover the whole of the supply/demand situation, the data available from public employment services is more or less incomplete. Furthermore, the data may not be representative of the overall labor market situation.

While details are not available on the extent to which employers report job openings to the local public employment service, both the number of employers reporting and the percentage of available jobs reported are considered to be low. Additionally, the jobs reported tend to be those with lower level qualification requirements. In some instances, these jobs also appear in newspaper help-wanted ads. Thus, the information available is inadequate and could be misleading.

Apart from this, public employment services are more highly concentrated in urban areas where they serve the formal (wage-earning) sector. Urban offices appear to function largely as a job exchange for the unemployed, with unemployment benefit claims taking up much of their time. Any generation and dissemination of labor market information is performed as a side-line.

In other words, the full potential of public employment services to determine and report the present and future demand for skilled workers is far from being adequately developed. Notwithstanding this situation — on perhaps on its very account — there is often little or no cooperation between vocational training planners and public employment services, especially at the local level.

Job Advertisements

There is little or no systematic monitoring of job (help-wanted) advertisements that appear in newspapers, trade publications, professional journals/magazines, and other print media. Yet, the collection and analysis of these public listings provides current labor market demand information and, over time, reveals employment trends in a host of occupations, e.g., a decrease in the demand for surveyors and an increase in the number of job vacancies for cooks.

Help-wanted ads provide a great body of handy and usable information. Unfortunately, only a part of the actual job openings are advertised and the information on these is often imprecise and/or incomplete. Therefore, the employer, employment agency, or service must be contacted in order to obtain further details, such as (a) whether the job was newly created or a replacement, (b) the number of applicants, (c) applicant qualifications relative to knowledge and skills requirements, and (d) the occupational profile of those hired. Skill gaps on the part of applicants point out a training need.

Advantages. When employers determine that classified ads are a cost-effective way of attracting a large pool of qualified job seekers, they advertise in newspapers, especially the Sunday editions. Large circulation and big city newspapers often contain voluminous sections of job advertisements which literally go begging for analysis. Such analysis could be undertaken by vocational training planners who, in discussing ads with the employers who floated them, could benefit directly from the views and attitudes of those employers regarding the knowledge and skills required. The analysis results would at least complement the signals received from other sources such as employment services. The collection and analysis of job advertisements is a comparatively easy and inexpensive approach to identifying jobs with favorable employment prospects.

Disadvantages. The jobs advertised are principally located in metropolitan areas. They often include more of the white- than blue-collar portion of the job market and may be limited to certain sectors of the economy where there is a high turnover rate (viz., hospitality and tourism, wholesale and retail trade, and construction). In addition, many employers do not use want ads for a host of reasons (e.g., they employ union workers from a hiring hall), and those that do tend to be the bigger companies who may also list their job vacancies with the public employment service. Consequently, the variety and number of job openings is under-represented. A further complication is the tendency of some employment agencies (placement firms) and employers, especially in the service industry, to run ads for jobs that have been filled or otherwise do not currently exist. This is done in order to expand their applicant pool in anticipation of future openings. Apart from these disadvantages, the number of advertisements in local or regional newspapers may be insufficient for determining demand/supply imbalances and trends.

Moreover, this approach deals with past and present labor market demand, not the future needs of a locality/region. It cannot, for example, indicate employment needs based on the growth of existing companies or the arrival of new ones. Furthermore, labor market information emanating solely from the analysis of job advertisements is inconclusive and must be compared with data from other approaches. This is essential in order to accurately determine what training courses and programs are necessary to supply the skilled workforce needed by the economy.

Key Informant Interviews

Interviews of individuals who are knowledgeable on workforce demand and the supply of skilled workers in a geographic area or economic sector offer another way to obtain valuable labor market information. Essential preconditions for the satisfactory outcome of key informant interviews include the careful selection of experts from (a) local/regional businesses; (b) public agencies; (c) economic development authorities; and (d) employer, worker, and professional organizations. Other important preconditions are the use of a structured interview schedule limited to well-constructed core questions, the timely analysis of the information obtained, and regular and frequent follow-up of the signals captured.

Core questions focus on current and expected workforce supply and demand imbalances. They also seek to determine factors underlying such imbalances, and the most critical workforce issues for the next 5 years. Other questions can address employer recruitment, screening, hiring, promotion, and training practices.

It is important to add that regular consultations with key informants, to discuss workforce supply and demand problems and/or interpret demand projections resulting from other approaches, are a prudent practice. Experience has shown that carefully selected individuals are able and willing to provide input.

Advantages. Key informant interviews are straightforward and modest in cost. They yield current indicators of workforce supply and demand imbalances in local/regional labor markets, and give early warning signals about forthcoming changes. In addition, information can be gathered on the various screening, hiring, and training practices in use. For example, are skilled jobs filled by promoting and training semi-skilled employees, or are apprenticeship programs used to prepare skilled workers? If these or other screening practices are used, there may be little opportunity for applicants who have already completed a training course or program and, therefore, expect skilled-worker jobs and wages (Campbell, 1996, chap. 1).

Key informant interviews can be held with individuals and groups, conducted in both the public and private sectors, and used in formal as well as informal labor markets. Selection of the proper key informants (those who have the facts) may be based on brief discussions, cross-checked by the question: Whom do you consider most knowledgeable on workforce demand in this area? In addition to others, the managers of private temporary placement (staffing) agencies can provide useful, albeit incomplete, information. Agencies that specialize in a particular occupation, such as clerical workers, often monitor supply and demand trends for their own business purposes. While they can provide some useful information, private agencies tend to know more about the demand for experienced workers than for new graduates.

Conduct of interviews and analysis of information collected can be entrusted to employment security, labor, and other state or local government departments, research institutes, universities, and, last but not least, VET providers.

Disadvantages. Key informants provide mainly qualitative information which reflects their personal views. In addition, the interviewer's bias, demeanor, and appearance can distort responses. Consequently, the information collected must be weighed with other available data. Apart from this, informants will not be representative in terms of research rigor, since the primary selection criterion for a key informant is "knowledge" (and not "randomness").

Whether these disadvantages are significant depends largely on the kind and scope of workforce information which VET providers have agreed as being essential for the effective and efficient planning of training courses and programs.

Employer Surveys

Ultimately, employers are the ones who decide on hiring. Theirs is the last word on what the market wants; they are the market. It makes sense, therefore, to seek their input. The idea is neither new nor original. The problem is how to do it. The most straightforward way is to survey private and public sector employers directly.

Mailed questionnaires and personal interviews are widely used methods of collecting information. Questionnaires and interview schedules can vary from open-ended to closed-ended instruments. The closed-form instrument is recommended when categorized data is needed; whereas, the open-ended is best-suited for preliminary exploration of untried situations. Telephone interviews are limited in use and not usually appropriate for a comprehensive survey.

Large, medium, and small businesses within a geographic area (including all places that workers are willing to travel without changing their residence) are identified and asked to estimate their present and future workforce requirements. They are also asked to provide information on knowledge and skill requirements, as well as any constraints in hiring VET graduates. This information helps to identify which businesses and occupations are growing and which are declining. It augments the data gathered from other approaches, such as reporting by employment services (Campbell, 1996, chap. 1).

Advantages. Employer surveys go right to the source of labor market demand, and can provide valuable information in a reasonably short time. By directly involving employers in needs determination and by considering their views regarding occupational projections and forecasts derived from other approaches, employers' willingness to cooperate in providing information is increased (American Institutes, 1976, p. 44).

The personal interview method of data collection provides a high response rate and yields precise and complete information on a host of relevant questions. The interview can also be used to inquire about anticipated changes in technology and to inform employers about the advantages of hiring VET graduates.

Disadvantages. Not all employers are able (or willing) to provide detailed predictions of workforce demand, especially those needs beyond the immediate future (not much more than one year). This is because many employers don't gather the data necessary for reliable estimates. In addition, when estimates are provided, they are apt to be biased toward overestimation if the employers feel that their replies will positively affect the availability of skilled workers. For example, if the skills concerned are scarce, employers will tend to overestimate their needs (Bertrand, 1992, chap. 2).

Furthermore, different ways of classifying jobs by various employers have detrimental effects on the comparability of the information collected. Comparability also suffers as changes in the workplace alter job requirements, especially when the jobs are not reclassified. Moreover, surveys that ask employers to provide relatively long-range estimates may not provide valid or reliable data. This is especially true during periods affected by extreme structural change and/or severe economic fluctuations.

Employers are deluged with forms and questionnaires to be filled out. Consequently, they respond under duress, even to government agencies. Suffice it to say, returns will be disappointingly few and the information provided may not be complete or adequate for planning purposes. The personal interview approach yields better results.

While surveying employers may not provide valid or reliable quantitative information on labor market demand, it is, nevertheless, an essential component of the qualitative analysis of the content and evolution of jobs and an assessment of labor market functioning (Bertrand, 1992, p. 34).

A further drawback of this approach is that costs vary from reasonable to high levels depending on the (a) data collection method used (mailed questionnaire or personal interview), and (b) number of employers surveyed. In any case, the main problem is that employer surveys do not cover skilled worker demand in the informal (self-employed) sector, particularly in rural areas.

Follow-up Studies

Follow-up (tracer) studies, usually conducted as part of the process for evaluating training courses and programs, are also important sources of information for vocational training planners. Although more oriented to workforce supply than demand issues, follow-up studies can be used to monitor labor market trends and determine the geographic mobility, wage, and career patterns of former trainees.

A follow-up questionnaire is developed, pilot-tested, and then mailed to course/program completers (graduates). (Guidelines for conducting follow-up studies are presented in Part 3 of this module — Supplemental Instruments.) Among other things, graduates are asked whether they (a) are employed full- or part-time, and (b) found a job for which they were trained. If graduates are employed in a different job, the studies also seek to find out how useful they consider their training to have been for their actual job. The questionnaire also asks graduates (a) about their wages, (b) how they found their job, (c) how long they looked before finding it, and (d) if different training would have made finding employment easier. (A prototype follow-up questionnaire is presented in Part 3 of this module — Supplemental Instruments.) An analysis of responses to these and other questions helps to determine the demand relevance of particular training courses or programs and sheds some light on the circumstances of entry into the labor market.

For best results, follow-up study questionnaires ought to be short and simple. It is recommended that follow-up studies be conducted approximately 6 months after course/program completion, at the end of the first year, and again at the end of the second and third years. Important information revealed by a three-year follow-up includes answers to the following questions:

1. Is it getting harder or easier to find a particular job?
2. Are graduates employed in jobs other than the one for which they were trained?
3. Are there shifts in the location in which graduates are employed?
4. What are the trends in earnings, by job title?

It is not necessary, at the outset, to conduct large-scale studies in order to gain an initial idea of the situation. To begin with, a study can be made of small populations, giving priority to courses or programs of questionable efficacy and which create the most urgent problems (Bertrand, 1992, chap. 7).

A significant problem is that unemployment rates, waiting periods, the acceptance of unrelated jobs in other geographic areas, and wages earned do not indicate on their own the success or failure of a particular course or program. This information needs to be supplemented by comparisons with (a) the employment record of a control group, (b) feedback from employer interviews, (c) different courses or programs, (d) other training institutions, and (e) local/regional employment conditions as well as trends.

Advantages. Follow-up studies supplement other sources of labor market information by revealing what has actually happened to graduates in the labor market. They are not an instrument for long-term projections or forecasts, but they are a tool for monitoring training courses and programs and facilitating adjustments to meet labor market requirements. Information collected on the employment and wages of graduates provides effective signals on the balance of demand by job title in local and regional markets.

Since the population surveyed is a group of former trainees who graduated at the same time and who were looking for employment at the same time and under similar conditions, vocational training planners can make good use of this tool for both labor supply and, to a lesser extent, demand and trend analysis. Follow-up studies are relatively inexpensive and can provide valuable information on knowledge and skill requirements. Furthermore, because they are being sent to graduates, a higher response rate can be anticipated (Campbell, 1996, chap. 1).

Disadvantages. Problems arise when too many objectives are set for follow-up studies other than those related to assessing how graduates have fared in the labor market. In addition, when questionnaires get unduly long or complicated, requiring considerable time to complete, response rates and the quality of the answers diminish. Low response rates also result from out-dated or incomplete addresses. Furthermore, information collected much more than 6 months after graduation suffers from the problem of remembering specific details. As a result, questionnaires may be incomplete or include unusable responses. There is also a problem with the data collected — self-reported information (provided by graduates only) has questionable validity.

In general, follow-up studies can contribute little to identifying the need for establishing new training courses or programs. However, this in no way diminishes their importance to vocational training planners and policy-makers when considering the merits of maintaining, expanding, improving, reducing, or discontinuing existing offerings.

Note. The advantages and disadvantages of the five labor market signalling approaches can be easily compared by consulting Table 2 on the following pages. In addition, Table 3 lists the labor market signalling approaches and identifies the value of the information they provide.

Table 2. Advantages and Disadvantages of Labor Market Signalling Approaches

Advantages	Disadvantages
Reporting by public employment services	
• Services are in touch with local, regional, and state labor market happenings, collecting, compiling, analyzing, and reporting information on unemployment and present as well as future job openings • Planners can use available data in determining training needs • No sizable investment of new resources is required for generating and disseminating the data	• Data available is more or less incomplete • Data may not be representative of overall labor market situation • Information available is inadequate and could be misleading due to extent to which employers report job openings, lower level qualification requirements of jobs reported, and duplication of information with that from newspaper help-wanted ads • Services are more highly concentrated in urban areas catering to the formal sector, where they function mainly as a job exchange for the unemployed • Generation and dissemination of labor market information is performed as a side-line

Table 2 (continued)

Advantages	Disadvantages
Analysis of job advertisements	
• Provides current demand information and, over time, reveals employment trends • Major newspapers contain voluminous sections of job advertisements • Analysis of advertisements complements signals received other sources • Analysis could be undertaken by vocational training planners who could also discuss ads with the employers who floated them • An easy and inexpensive approach to identifying jobs with favorable employment prospects	• Employer must be contacted for further details when information is imprecise and/or incomplete • Focuses principally on metropolitan areas • Often includes more white- than blue-collar jobs and may be limited to certain sectors of the economy • Variety and number of job openings underrepresented due to some employers not using want ads • Some advertised jobs have already been filled or otherwise do not currently exist • Number of ads in local or regional newspapers may be insufficient to construct a sample for analysis • Deals with past and present, not future, needs and does not predict future industry growth or change

Table 2 (continued)

Advantages	Disadvantages
Key informant interviews	
• Straight-forward and modest in cost • Information yields current indicators of workforce supply and demand imbalances in local/regional markets • Information gives early warning signals about significant changes in workforce supply and demand, and/or confirms trends previously documented • Information can be gathered on employers' screening, hiring, and training practices • Can be conducted with individuals and groups, in the public and private sectors, as well as in formal and informal labor market sectors • Conduct of interviews and analysis of information can be entrusted to government, research institutes, universities, etc.	• Information is mainly qualitative, reflecting personal views and perceptions • Information is not representative in terms of research rigor

Table 2 (continued)

Advantages	Disadvantages
Employer surveys	
• Goes right to the source of labor market demand • Provides useful information in a reasonably short time • Employers' willingness to cooperate is increased, because their views and suggestions are considered • Personal interview method provides a high response rate and yields precise and complete information on a host of relevant questions	• Not all employers are able (or willing) to provide detailed predictions of occupational demand • Estimates provided by employers may be biased toward overestimation if they feel that their replies will positively affect the availability of skilled workers • Different employers may classify jobs in different ways, thus affecting the comparability of the information collected • Comparability suffers as changes in the workplace alter job requirements, especially when the jobs are not reclassified • Low level of confidence in the accuracy of survey information • Surveyed employers may not provide valid or reliable information, especially when asked for long-range estimates • Employer surveys do not cover skilled worker demand in the informal sector, particularly in rural areas

Table 2 (continued)

Advantages	Disadvantages
Follow-up studies	
• Reveal what actually happened to graduates in the labor market • Monitor training courses/programs, thereby facilitating adjustments to meet labor market requirements • Information collected on employment and wages of graduates provides signals on the balance of supply and demand by job title in local/regional markets • Relatively inexpensive and produce useful results quickly	• Problems arise when including objectives that are not related to how graduates have fared in the labor market • Response rates and the quality of answers diminish, if questionnaires are too long or complicated • Poor response rates result from out-dated or incomplete addresses • Information provided by graduates has questionable validity • Contribute little toward identifying the need for new training courses/programs

Table 3. Labor Market Signalling Approaches and the Value of the Information They Provide

Categories / Approaches[a]	Workforce		Knowledge and skill requirements[b]	Employer practices	
	Supply	Demand		Screening	Hiring
Public employment services	MV	MV	MV	LV	LV
Job advertisements	None	MV	MV	LV	LV
Key informant interviews	LV	MV	MV	HV	HV
Employer surveys	None	MV	HV	HV	HV
Follow-up studies	HV	MV	MV	None	None

Key.
HV = High-value information
MV = Moderate-value information
LV = Low-value information
None = No direct information

Notes.

[a] Each approach listed in column 1 was judged against the maximum potential value of the information which could be collected regarding five categories (headings of columns 2 - 6). This table shows that the choice of "best" approach depends on the information needed in addition to the particular advantages and disadvantages of each approach (as detailed in Table 2).

The most reliable information about current and future workforce demand results from the assembling of data from two or more of the approaches listed in column 1.

[b] A job and task analysis must be conducted to identify all the knowledge and skill requirements of a successful job incumbent.

Progress Check -- Part 2 — Labor Market Signalling Approaches

Directions. Read each of the following items carefully and write in your answer. If you have difficulty with any of the items, go back and review the relevant content before continuing. Check your answers against those provided in the Progress Check Feedback at the end of this module.

1. Name the five labor market signalling approaches that were described.

   A. ____________________

   B. ____________________

   C. ____________________

   D. ____________________

   E. ____________________

2. True or False: Public employment services determine and report the present and short-term future demand for skilled workers.

   A. True ____ B. False ____

3. True or False: The analysis of job advertisements in newspapers, etc., when supplemented by direct contact with the establishments/employers, provides quantitative information on future labor market needs.

   A. True ____ B. False ____

4. True or False: Workforce demand information from the analysis of job advertisements is inconclusive.

   A. True ____ B. False ____

Progress Check -- Part 2 (continued)

5. List four essential preconditions for the satisfactory outcome of a key informant interview.

   A. ____________________

   B. ____________________

   C. ____________________

   D. ____________________

6. Identify the most significant disadvantage of a key informant interview. ____________________

7. Name two widely used methods of collecting information from employers.

   A. ____________________

   B. ____________________

8. Explain why some employers are not able or willing to provide detailed workforce demand information. ____________________

9. Name the labor market signalling approach used to determine workforce demand that is also highly useful for supply analysis. ____________________

10. True or False: High rates of graduate unemployment, the acceptance of unrelated jobs, and low wages indicate the failure of a training program.

    A. True ____ B. False ____

Part 3 — Supplemental Instruments

A Comment

The foregoing overview of the major **workforce projection and forecasting approaches** (Part 1), and **labor market signalling approaches** (Part 2), is not exhaustive. Since the approaches described in Part 1 of this module will continue to be primarily the responsibility of economists or workforce planners/analysts, in view of their relevance to wider issues of employment and labor market policies, in addition to vocational training planning, those concerned with the latter might be satisfied with gaining overall knowledge in this respect.

However, such knowledge must include an understanding of the advantages and disadvantages of each approach and its potential for determining labor market demand. It should enable vocational training planners to identify the approaches that they could undertake without having to wait for economists or manpower planners/analysts to fill labor market information gaps, which in some localities and regions are considerable. Reporting by public employment services, analysis of job advertisements, key informant interviews, employer surveys, and follow-up studies are strong candidates in this respect. It is for this reason that this last part of the module — Supplemental Instruments — presents (a) an example of the organization and analysis of key informant interviews, (b) guidelines for conducting follow-up studies, and (c) a prototype follow-up questionnaire.

Owing to the fact that none of the approaches can claim predominant significance, the use of several approaches is preferable to the application of any one. Moreover, given the past emphasis placed on mechanistic workforce projection and forecasting approaches — with disappointing results — there is room to conduct a variety of labor market signalling approaches.

The process nature of workforce demand and supply interactions, as reflected in [ever-changing] labor supply and demand imbalances, and the special importance of capturing these changes in a timely fashion also suggests the importance of labor market signalling approaches. These approaches involve routine data collection and analysis — rather than the mechanistic type workforce projections and forecasts which are made at a single point in time (Campbell, 1996, chap. 1).

An Example of the Organization and Analysis of Key Informant Interviews

The following example describes an individual in-person key informant interview process. It was performed as part of an assessment of the workforce and training requirements of a Forestry Development Strategy. The interviews were carried out by a labor market analyst and a vocational training planner. Their primary purpose was to supplement existing projections, which were thought to be too aggregate and contradictory, and not sufficiently up-to-date to serve as adequate planning inputs.

The interviews were planned and organized in the following manner: The first step consisted of obtaining the names and contact information for experts in the forestry sector who were knowledgeable about workforce supply and demand. This was done through general discussions with individuals in forestry departments and institutions, as well as forest and timber businesses, during which the question was posed: Whom do you consider most knowledgeable on workforce demand and training in the forestry sector? Altogether, 15 experts were identified as potential key informants. However, only ten were located in the same geographic area, and judged to be qualified to serve as key informants. These ten key informants also provided a balanced representation of the different major forestry subsectors, both public and private.

Four core questions were prepared. They addressed current and future workforce demand and supply imbalances, the main factors underlying such imbalances, and workforce issues likely to arise over the next 5 years. Five years was the time horizon visualized by the Forestry Development Strategy. A final question solicited further comments, suggestions, or elaborations on the four core questions.

The key informants were asked the following questions:

1. What occupational/skills category(s) — professional, technical, vocational — is currently in short supply? In oversupply?
2. What occupational/skills category(s) is likely to face increases of demand in the next 5 years? Likely to face decreases in demand?
3. What factors will have an important influence on increases (or decreases) in demand?
4. What will be the most critical workforce issues in forestry and timber industries over the next 5 years?

5. Would you please comment on the above questions, for example, how you plan to meet workforce shortages.

Of the ten key informants, eight answered the five questions during a personal interview, for a response rate of 80%. The two others were very busy and could not schedule a personal interview, but did respond to some of the questions over the telephone.

An analysis of the replies led to the following conclusions:

1. The eight key informants agreed that qualified managerial and supervisory personnel were in the most critical shortage, followed by skilled loggers, skidder and other logging machinery operators. Two key informants expressed the view that forest rangers, technicians, and unskilled workers were currently in oversupply.

2. There was general agreement that experienced managers, logging supervisors, and skilled loggers (competent in improved felling techniques) were badly needed in the immediate future. One key informant noted that he foresaw diminishing requirements for technical and vocational skill groups.

3. With the increased export orientation of timber production envisioned by the Forestry Development Strategy, most key informants foresaw a need for an all-out effort of skill upgrading "across the board," that is, "a call for more highly skilled workers at all levels, from managers down to machine operators." In view of the urgent need for "harvesting and transporting the forestry crop economically" and meeting foreign competition, "by far, the most critical workers will be related to occupational groups engaged in these forestry operations."

4. Most key informants referred to the brain-drain problem which went beyond the issue of skill development. An incentive system needed to be adopted for managers and senior skilled personnel, to stem the tide of "the incredible competition in the region. Otherwise, the country will end up training a high-level workforce for more developed countries . . . where most of our highly skilled workforce has migrated to."

On the timber industry side, some key informants stressed the particularly urgent need for imparting higher-level technical training to operators such as sawers, machinists, saw doctors, and maintenance and repair workers for sawmilling and woodworking machines. The absence of publicly-supported training courses and programs for the timber industry was criticized.

This brief analysis of key informants' responses largely confirmed the broad picture of the general workforce and skill needs, as put forward by existing projections. However, the interviews made it possible to pinpoint more explicitly major priorities of the training effort required to cope with current and prospective workforce supply and demand as well as skill requirements.

Most of the key informants' responses were admittedly of a qualitative nature. On the other hand, some key informants did provide — without having been specifically asked to do so — quantitative needs estimates. This pertained in particular to the specific subsector for which the informant concerned had primary responsibility.

Another important conclusion drawn from these interviews is that (a) most key informants were willing to participate and cooperate during the interview (some of them stating it had been the first time they were asked about workforce demand and training needs pertaining to the labor force under their responsibility); and (b) carefully selected key informants are an important source of workforce information which, untapped, deprives workforce analysis and training needs assessment of a valuable contribution by those who are knowledgeable on workforce and training questions in the forestry sector. Moreover, the costs involved in obtaining this valuable information were modest.

Progress Check -- **Part 3A — Supplemental Instruments**

Directions. Read each of the following items carefully and write in your answer. If you have difficulty with any of the items, go back and review the relevant content before continuing. Check your answers against those provided in the Progress Check Feedback at the end of this module.

1. Describe the primary purpose for conducting the key informant interviews in forestry.

   ____

   ____

2. Identify the first step in organizing the survey. ______________________

   ____

3. List the agencies contacted to identify potential key informants.

   A. ____

   B. ____

   C. ____

4. What was the survey response rate? ______________________

5. The survey revealed that a shortage of ______________________

   and ______________________ personnel was the most critical.

6. Most of the information reported in the analysis was _?_.

   A. Quantitative ____ B. Qualitative ____

7. Identify two important conclusions about key informants drawn from the forestry sector survey.

   A. ____

   ____

   B. ____

   ____

Guidelines for Conducting Follow-up Studies

Introduction

The practical side of conducting a follow-up (tracer) study using a mailed questionnaire (survey instrument) to collect data is briefly presented here as an 11-step process. **Mailed questionnaires** are normally a cost-effective method of collecting quantifiable information from geographically dispersed as well as mobile individuals.

Prepare for the study

1. Determine the resources such as time and expertise necessary for developing, pilot-testing, printing/duplicating, and mailing a questionnaire, as well as processing, interpreting, and reporting the data collected. Prepare a budget that shows estimated costs.
2. Inform trainees who are about to complete their course or program about the purpose and procedures of the follow-up study. It is essential that trainees be encouraged to participate; make it clear that the purpose is to determine what happens to them after they graduate, so that future training can be more relevant to the labor market.
3. Ask trainees to complete a baseline information form which includes their name, address, phone number, gender, age, work experience, etc. Add individual training performance data (attendance, grades, etc.) and statements about the trainee's behavior to the form. This information is useful when interpreting data collected from the study.
4. Set up a control group of individuals who will enter the labor market at about the same time as the trainees, but who did not follow a training course or program. **This is an optional, but highly desirable step**. The characteristics of these individuals should be similar to those of the trainees. A control group makes it possible to compare the labor market experiences of those who received training with the experiences of those who did not receive training.
5. Develop the questionnaire. It is important to ask only those questions that will yield essential information. Demographic and other information

available from the baseline information form (step 3) or existing records is omitted and all nice- or interesting-to-know, but non-essential, items are left out. A prototype follow-up questionnaire follows these guidelines. It groups common questions and presents them in four parts. At the end of part one, which is completed by everyone, respondents are directed to proceed to either part two or part three depending on their employment status. As was the case with part one, all respondents are asked to complete part four. This questionnaire includes an appropriate combination of **forced-choice items** (e.g., Part 2, items 7 and 8) and **open-ended items** (e.g., Part 2, items 9 and 10). After deciding on the type(s) of items to use, they must be carefully worded so that (a) the response is not implied, and (b) all respondents interpret the questions as intended.

6. Select a sample of trainees to pilot-test the questionnaire. During the pilot test, the trainees are asked to indicate if any items are unclear or difficult to answer. Revisions are made, if necessary, on the basis of the pilot-test results. Afterward, a high-quality questionnaire is printed in sufficient quantity. It may be desirable to color code the various parts or versions (e.g., second mailing, etc.) of the questionnaire for ease in sorting and use.
7. Prepare a cover letter. It should be clear and to the point, providing the necessary explanatory information. An effective cover letter (a) states why the graduate has received the questionnaire, (b) identifies the purpose of the follow-up study, (c) explains why the questionnaire should be completed and returned, (d) assures confidentiality of the responses, (e) indicates approximately how much time it will take to complete the questionnaire, (f) provides directions on how and when to respond, and (g) expresses appreciation for participating in the study. This information may also appear on the printed questionnaire. The cover letter ought to be on letterhead stationery and each one should have an original signature by some official known by the graduates.

Conduct the study

8. Mail the cover letter and questionnaire, along with a self-addressed, stamped envelope, to all course/program graduates, or to a random sample if the population is large. When conditions allow, a telephone call, just prior to the mailing, will personalize the request and increase the rate of return. Send a second mailing to non-respondents after a 2-week waiting period. A follow-up telephone call to the remaining non-respondents may be necessary after an additional 2-week waiting period.
9. Tally the data and compile the information from open-ended items and the comments provided. Hand-tally sheets can be used for small populations or when automated (computer) data summaries are not available. When tally sheets are prepared at the same time as the questionnaire, they show how the collected information will appear. This facilitates changes to items in order to simplify the tabulation and analysis of data and written responses.

Prepare a report

10. Prepare a report which documents follow-up study activities and the results. The data can be presented using a variety of methods. For example, it can be outlined in narrative text and illustrated using tables and charts. Based upon an analysis and interpretation of the data and written responses, draw conclusions and make recommendations about the courses and/or programs studied.
11. Collect information about the costs incurred in developing and delivering the training. This information is necessary to calculate the resources expended on the training of each participant, in terms of facilities, equipment, materials, personnel, and so forth. Such information facilitates cost-benefit calculations. **This is an optional, but highly desirable, step.**

Information on planning and conducting a follow-up study is available in Module A-10, Conduct a Student Follow-Up Study (American Association for Vocational Instructional Materials, 1978, pp. 3-62), which also provides further references.

A Prototype Follow-up Questionnaire

Name ______________________________ Date ____________________

Current address ____

Home phone number ( ) ____

The purpose of this follow-up survey is to find out about your employment since graduation. Your responses will be confidential. Please take a few moments today to complete this survey and return it in the enclosed, self-addressed, stamped envelope. Your responses are valuable and your assistance is greatly appreciated. **Thank you.**

Part 1 (for EVERYONE)

1. Course/program completed: ______________________________
2. What is your present status? (Check all that apply.)

   ____ Employed by a private enterprise (company)

   ____ Employed by a government agency

   ____ Self-employed

   ____ Working in a family business

   ____ In the military service

   ____ Pursuing further education/training (please specify)

   ____

   ____ Other (please specify) ______________________________

   ____ Unemployed

   (If currently unemployed, proceed to Part 3)

CONTINUED ON NEXT PAGE

Part 2 (ONLY for those who are currently employed)

3. Are you working: (Check all that apply.)

____ Full-time

____ Part-time

____ Locally

____ In the job you were trained for

____ In a job related to your training

____ In a job that does not use your training

4. What is your job title? ________________________________

5. How did you find this job? (Check one.)

____ Direct application to employer (walk-in)

____ Training institution job placement service

____ Public employment service

____ Private employment agency

____ Friend or acquaintance

____ Parent(s) or other relative

____ Help-wanted ads (flyer, newspaper, journal, or magazine)

____ Other (please specify) ________________________________

6. How long did you look (wait) before finding this job?

____ Less than 1 month

____ 1 to 2 months

____ 3 to 4 months

____ More than 4 months

CONTINUED ON NEXT PAGE

Part 2 (continued)

7. What was your starting hourly wage rate? (Check one.)

____ Less than $6.00
____ $6.00 to $7.99
____ $8.00 to $9.99
____ $10.00 to $11.99
____ $12.00 to $13.99
____ $14.00 or more

8. What is your present hourly wage rate? (Check one.)

____ Less than $6.00
____ $6.00 to $7.99
____ $8.00 to $9.99
____ $10.00 to $11.99
____ $12.00 to $13.99
____ $14.00 or more

9. What subjects/topics from your training were **most helpful** in your job?

____
____
____

10. Which subjects/topics were **least helpful**?

____
____
____

11. Would you have been employed without training?

____ Yes
____ No

Comment: ______________________________

CONTINUED ON NEXT PAGE

Part 2 (continued)

12. Did your training include all that was necessary to perform your job?

____ Yes ____ No

Comment: ____

13. Did your training qualify you for a higher-level job than your present employment?

____ Yes ____ No

Comment: ____

14. Have you received any job training from your employer?

____ Yes ____ No

Comment: ____

CONTINUED ON NEXT PAGE

Part 3 (ONLY for those who are **currently unemployed**)

15. Are you actively seeking employment?

____ Yes ____ No

Comment: ____________________

16. Do you feel adequately prepared for a job?

____ Yes ____ No

Comment: ____________________

17. Would a different training course or program have improved your chances for employment?

____ Yes ____ No

Comment: ____________________

18. How long have you been looking for employment?

____ Less than 4 months ____ 4 months or more

Part 4 (for EVERYONE)

19. Please add any particular observations, comments, and/or suggestions about the training you received and about possible ways to improve it. (For example: Needed more practice in performing job skills.)

____

____

You are now finished with the survey. Please return it in the addressed and stamped envelope provided. Thank you for taking the time to help us.

Note. Adapted from Education and Training for Work: Planning Programs (pp. 41-43), by C. P. Campbell, 1996, Lancaster, PA: Technomic. Copyright 1996 by Technomic Publishing Company.

Progress Check -- **Part 3B — Supplemental Instruments**

Directions. Read items 1 and 2 carefully and write in your answers. If you have difficulty, go back and review the relevant content before continuing. Check your answers against those provided in the progress check feedback at the end of this module.

1. List the seven steps in **preparing for** a follow-up study.

   A. ______________________________

   ____

   B. ______________________________

   ____

   C. ______________________________

   ____

   D. ______________________________

   ____

   E. ______________________________

   ____

   F. ______________________________

   ____

   G. ______________________________

   ____

2. Identify the advantage of using a control group when conducting a follow-up study.

   ____

   ____

LEARNING ACTIVITIES

1. Prepare a draft questionnaire for use in a follow-up study. Compare it with the prototype questionnaire provided in this part of the module.
2. Pilot-test the questionnaire on a sample of trainees and make all appropriate revisions.

References

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Bezdek, R. H. (1974). *Long-range forecasting of manpower requirements.* New York: Institute of Electrical & Electronics Engineers.

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Richter, L. (1986). *Training needs assessment and monitoring.* Geneva: International Labour Office.

Author Note

The work of Lothar Richter, a manpower consultant with extensive international experience, served to guide the author in organizing this self-contained learning module.

Progress Check Feedback -- **Part 1 — Workforce Projection and Forecasting Approaches**
(pp. 9-10)

1. List the three workforce projection and forecasting approaches described in Part 1.

   A. *Manpower (workforce) requirements approach (pp. 4-5)*

   B. *Econometric models (pp. 5-6)*

   C. *Input-output models (pp. 6-7)*

2. Identify the approach that relates forecast economic growth to the output of VET institutions. *Manpower (workforce) requirements approach (p. 4)*

3. Name the reasons for the difficulty in accurately converting from sectoral/sub-sectoral to more specific occupational employment possibilities in the workforce requirements approach.

   A. *Overly optimistic estimates (at the sectoral level) of employment growth (p. 5)*

   B. *Increasingly rapid economic change (p. 5)*

   C. *Lack of allowance for technological advances (p. 5)*

   D. *Lack of allowance for changing business practices (p. 5)*

   E. *Lack of allowance for occupational mobility (resignations, layoffs, and discharges) (p. 5)*

   F. *Lack of allowance for workers withdrawing from and returning to the workforce (e.g., quit to raise a child or pursue further education, then return) (p. 5)*

Progress Check Feedback -- Part 1 (continued)

4. Identify two models that provide an alternative to the first step of the workforce requirements approach.

   A. *Econometric models (p. 5)*

   B. *Input-output models (p. 6)*

5. Name the workforce projection and forecasting approach that takes into account inter-industry relationships. *Input-output models (p. 6)*

6. Name the steps which characterize an input-output analysis.

   A. *A projection is made of the output of a particular industry (p. 6)*

   B. *A workforce coefficient is applied to the absolute increase in production (p. 6)*

   C. *The projection and workforce coefficient are translated into VET requirements (p. 6)*

Progress Check Feedback -- Part 2 — Labor Market Signalling Approaches
(pp. 27-28)

1. Name the five labor market signalling approaches that were described.

   A. *Reporting by public employment services (pp. 11-13)*

   B. *Analysis of job advertisements (pp. 11 & 13-14)*

   C. *Key informant interviews (pp. 11 & 14-16)*

   D. *Employer surveys (pp. 11 & 16-18)*

   E. *Follow-up (tracer) studies (pp. 11 & 18-20)*

2. True or False: Public employment services determine and report the present and short-term future demand for skilled workers.

   A. True ____ B. False *X*
   (... the data is seldom analyzed and few, if any, decisions are reached ... — p. 12; The full potential to do this is far from being adequately developed — p. 13)

3. True or False: The analysis of job advertisements in newspapers, etc., when supplemented by direct contact with the establishments/employers, provides quantitative information on future labor market needs.

   A. True ____ B. False *X*
   (... current labor market demand and ... — pp. 13-14)

4. True or False: Workforce demand information from the analysis of job advertisements is inconclusive.

   A. True *X* B. False ____
   (... and must be compared with data from other approaches — p. 14)

Progress Check Feedback -- **Part 2** (continued)

5. List four essential preconditions for the satisfactory outcome of a key informant interview.

   A. *Careful selection of experts from (a) local/regional businesses; (b) public agencies; (c) economic development authorities; and (d) employer, worker, and professional organizations (pp. 14-15)*

   B. *Use of a structured interview schedule (p. 15)*

   C. *Timely analysis of the information obtained (p. 15)*

   D. *Regular and frequent follow-up of the signals captured (p. 15)*

6. Identify the most significant disadvantage of a key informant interview. *Provides mainly qualitative information which reflects personal views (p. 16)*

7. Name two widely used methods of collecting information from employers.

   A. *Mailed questionnaires (p. 16)*

   B. *Personal interviews (p. 16)*

8. Explain why some employers are not able or willing to provide detailed workforce demand information. *... employers don't gather the data necessary for reliable estimates (p. 17)*

9. Name the labor market signalling approach used to determine workforce demand that is also highly useful for supply analysis. *Follow-up (tracer) studies (pp. 18-19)*

10. True or False: High rates of graduate unemployment, the acceptance of unrelated jobs, and low wages indicate the failure of a training program.

    A. True ____ B. False *X*

    (This information needs to be supplemented by comparisons with (a) the employment record of a control group, (b) feedback from employer interviews, (c) different courses or programs, (d) other training institutions, and (e) local/regional employment conditions as well as trends — p. 19)

Progress Check Feedback -- Part 3A — Supplemental Instruments
(p. 33)

1. Describe the primary purpose for conducting the key informant interviews in forestry.

   To supplement existing projections, which were thought to be too aggregate and contradictory and not sufficiently up-to-date (p. 30)

2. Identify the first step in organizing the survey. *Obtaining the names and contact information for experts in the forestry sector (p. 30)*

3. List the agencies contacted to identify potential key informants.

   A. *Forestry departments (p. 30)*

   B. *Institutions (p. 30)*

   C. *Forest and timber businesses (p. 30)*

4. What was the survey response rate? *80% (p. 31)*

5. The survey revealed that a shortage of *qualified managerial (p. 31)* and *supervisory (p. 31)* personnel was the most critical.

6. Most of the information reported in the analysis was ? .

   A. Quantitative ____ B. Qualitative *X* *(pp. 31-32)*

7. Identify two important conclusions about key informants drawn from the forestry sector survey.

   A. *Key informants were willing to participate (p. 32)*

   B. *Carefully selected key informants are an important source of workforce information (p. 32)*

Progress Check Feedback -- **Part 3B — Supplemental Instruments**
(p. 42)

1. List the seven steps in **preparing for** a follow-up study.

A. *See pages 34-35, steps 1-7*

B.

C.

D.

E.

F.

G.

2. Identify the advantage of using a control group when conducting a follow-up study.

Makes it possible to compare labor market experiences of those who receive training with the experiences of those who do not (p. 34, step 4)

SATISFACTION RATING INSTRUMENT

Directions: Please respond to each of the following 17 statements by circling the number that corresponds to your level of disagreement or agreement. The scale is **1** = strongly disagree to **9** = strongly agree. The instructional material phrase (below in bold type) is the preliminary part of each statement.

The instructional material used (module)

	Statements	Strongly disagree								Strongly agree
1.	was satisfying to me.	1	2	3	4	5	6	7	8	9
2.	suited my learning style.	1	2	3	4	5	6	7	8	9
3.	was enhanced by the inclusion of learning objectives.	1	2	3	4	5	6	7	8	9
4.	increased my professional vocabulary.	1	2	3	4	5	6	7	8	9
5.	taught knowledge along with skills.	1	2	3	4	5	6	7	8	9
6.	maximized learning.	1	2	3	4	5	6	7	8	9
7.	was frustrating to me.	1	2	3	4	5	6	7	8	9
8.	encouraged me to learn.	1	2	3	4	5	6	7	8	9
9.	required excessive effort for the benefits received.	1	2	3	4	5	6	7	8	9
10.	embedded learning in the application environment.	1	2	3	4	5	6	7	8	9
11.	included illustrations, examples, and questions which facilitated learning.	1	2	3	4	5	6	7	8	9
12.	provided continuous support throughout the learning process.	1	2	3	4	5	6	7	8	9
13.	enabled me to acquire relevant experience.	1	2	3	4	5	6	7	8	9
14.	limited my ability to learn.	1	2	3	4	5	6	7	8	9
15.	provided training on specifics.	1	2	3	4	5	6	7	8	9
16.	included all that was necessary to perform.	1	2	3	4	5	6	7	8	9
17.	enhanced my motivation and facilitated learning.	1	2	3	4	5	6	7	8	9

Please jot down what you liked about the instructional material. ____________________

____

Please jot down what you didn't like about the instructional material ____________________

____

Thank you. Your feedback will remain confidential.

C^{2}99

Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Assignment Sheet

COURSE DELIVERABLE – LABOR MARKET DEMAND

Course Objective: Consider the merits of various labor market signaling approaches for collecting information on the supply/demand balance of skilled workers.

Subject Matter Topic: The salient characteristics of labor market signaling approaches

References:

1. Textbook, **Education and Training for Work: Planning Programs** (Chapter 1)
2. Handout (module), **Determining the Demand for Skilled Workers**

Assignment: (Responsibilities and requirements)

1. Identify and describe concisely the salient characteristics of any two (2) of the five labor market signaling approaches discussed in the references. Include a table showing their advantages and disadvantages.
2. Staple pages in top left corner and submit without cover stock or plastic page protectors.

Due Date:

1. Milestone **submittal date** ______________.

C^{2}99

Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Progress test No. 5

DETERMINING TRAINING NEEDS

Directions: Each of the following items contains four (4) alternatives, one of which provides the **best answer**. Circle the letter which precedes the best answer.

NOTES

1. Training and development needs result from

   A. current human performance not being what is required by organizational objectives.
   B. future responsibilities requiring new skills.
   C. organizational goals of helping employees achieve their potential.
   D. all of the above.

2. A customer survey may be carried out when investigating training needs because

   A. performance problems may exist that are unknown within the organization but that frustrate customers.
   B. customers are more aware of the overall effectiveness of operations than those within the organization.
   C. most training and development needs can be identified in this way.
   D. customer complaints are important.

3. A good policy when conducting needs surveys is to

   A. concentrate only on the target group in order to increase objectivity.
   B. carefully avoid placing constraints on how the survey results will be used before the survey is carried out.
   C. concentrate on concrete responses and avoid eliciting attitudes, motives, and other subjective responses.
   D. survey three levels: the target group, their supervisors, and their subordinates.

4. Organizational audits reveal training needs by

   A. using surveys of perceived training needs.
   B. exposing performance deficiencies that show up in records of the results of operations.
   C. eliciting opinions concerning future training needs from a panel of informed managers within the organization.
   D. establishing a system of assessment methods that do not rely on existing records.

Human Resource Development Department

The University of Tennessee
Information Sheet

NEEDS ASSESSMENT: A RATIONALE AND METHODOLOGY

Introduction

Simply stated, needs assessment is the process of identifying and clarifying human performance problems. As defined by Lampe (1986), it is "an effort to reveal the gaps between what people do at work and what their employers would like them to do" (p. 101). Needs assessment is a process that provides the information necessary for informed decision making. Kaufman (1987) maintains that "a needs assessment provides the direction for useful problem resolution through identifying, documenting, and selecting appropriate problems for training" (p. 20).

Before a trainer considers planning or providing a training course or program, a properly conducted needs assessment should have determined that the identified problem is one which can be solved through training. A needs assessment which shows that a problem cannot be solved by training alone is just as important as one which shows that training is the answer. It is the decision maker's ethical and professional responsibility to analyze all alternative interventions and make recommendations accordingly.

The conduct of a needs assessment should be planned, organized, systematic, and goal-directed. Abel (1986) recommends that "Goals should be specific, measurable, and objective" (p. 70), and categorized according to either a functional or individual level. On the functional level, they should relate directly to the accomplishment of the organization's goals. On the individual level, a distinction should be made between what a worker needs to know and what he or she should be able to do (p. 70).

Training Limitations and Alternative Interventions

Notwithstanding all its value — or perhaps on that very account, training should not be proposed as the answer to those organizational problems that are better approached in other ways. After a problem has been identified, it ought to be thoroughly investigated to determine its cause before training is prescribed as a bona fide solution. For example, **training is not the answer when**:

1. The knowledge, skills, and attitudes to be trained cannot be used on the job.
2. A change in behavior cannot be observed or measured.
3. The job environment will not permit the performance of the behaviors acquired.
4. Workers are capable of performing job tasks to standards, but for a variety of reasons, are unmotivated or unwilling to do so.
5. The organization's goals can be accomplished more effectively through other interventions.
6. There are insufficient financial, human, physical, or technological resources to complete training.

If any of these situations exist, training will be an ineffective response to the organizational problem. A different intervention or possible training as part of a broader plan of action should be considered.

When the knowledge and skills to be trained cannot be used on the job, it is usually because of an incorrect decision during the planning function. The mistake can be the result of inadequate or faulty information at the time of the original plan. It can also come from changing conditions on the job between the planning and plan implementation. Before any training is undertaken, the skilled worker needs of the immediate future must be evaluated. And they must be evaluated carefully!

If the change in worker behavior cannot be measured, then it should not be trained. Unless it is possible to get a specific measure of trainee performance before, during, and after training, the employer will never know whether the effort failed or succeeded. Trainers must answer the question, "What will have to happen to show me that the trainee has attained job task standards?"

Measuring change becomes a problem when learning objectives are (a) not used, (b) incomplete or inconsistent with job task performance, or (c) phrased in ambiguous language. For example, a poorly-written objective like "The trainee will understand the importance of maintaining accurate records of the patient's temperature" is abstract and impossible to observe and measure. Properly stated, the learning objective would read: "Measure a patient's temperature using an oral thermometer to within one-half of one degree and record the reading on the patient's chart in accordance with clinical procedures and without assistance." Now the trainee, trainer, and all who work with the learning objective can determine when proficiency has been attained.

When workers are capable of performing job tasks to standards, but are unmotivated or unwilling to do so, training will not solve the problem. There may be many causes for this unwillingness — the job may be monotonous, boring, or workers may lack the incentive to do it well. The absence of feedback may cause workers to doubt the value of their performance. On-the-job conditions may be such that the worker is not rewarded for performing tasks properly. The worker may not even know the job task standards. Group pressures and group norms may be causing reduced production or lower standards. Those who perform job tasks properly may be penalized. In none of these cases would training the worker in how to do the job better bring about any appreciable improvement in productivity or standards.

The question to ask in this situation is "If the workers' jobs depended on it, could they perform the job tasks properly?" Training is appropriate only if the answer is **no**. If a worker is capable of performing the job tasks to standards, but is not doing so, other interventions are indicated. The following eight side-headings provide information on non-training interventions.

Communicate Expectations

Before workers can perform effectively, they must know exactly what they are expected to do and what acceptable performance looks like. By identifying the job tasks and providing performance standards, then adding positive consequences for proper performance, workers will tend to repeat their good performance.

Add Feedback

When workers don't know how well they are doing, that is, when they don't see the results of their accomplishments or receive feedback concerning their performance, they will most likely never improve. Workers need to know when they are meeting expectations and when they are not. Feedback in itself motivates workers; it gives them more reason to care, to perform well. Periodic feedback can produce dramatic results, and it is a relatively inexpensive intervention.

Eliminate Adverse Physical and Environmental Conditions

Undesirable environmental and physical conditions in the workplace hamper the effective use of knowledge and skills. Bad equipment, materials, and supplies, as well as conditions which cause health and safety problems, all inhibit job performance.

Workers are often prevented from implementing trained behaviors by attitudinal or social obstacles. Whenever newly acquired skills and abilities conflict with closely held attitudes and values, the work environment will not support their use. For example, training Saudi Arabians to be waiters and cooks will be fruitless if they must work in a region of the country where social mores mitigate against Saudis being employed in these jobs. In such cases, the attitudinal environment must be changed — either before training starts, or as part of a broader developmental strategy.

Similarly, to train workers in ways that maximize quality and productivity will be futile if the work group tends to penalize those who exceed group norms. In this case, the on-the-job environmental obstacle will interfere with or prevent implementation of the trained behavior. Before training, those who are responsible should assure themselves not only that it is possible to develop the desired behaviors — but also that group pressures at the workplace can be modified to accept the new knowledge, skills, and attitudes.

Enrich the Job

The trend toward simplification and specialization has resulted in many "impoverished" jobs. Some are so narrow, monotonous, and tiresome that workers do not maintain satisfactory levels of performance. Apart from adding variety through job rotation, jobs can be redesigned to encompass a complete and meaningful piece of work (product). This increases interest and leads to a sense of accomplishment. Enriched jobs add value and importance which motivate workers.

Pay Attention to Interpersonal, Group, and Intergroup Behaviors

Workers within an organization may be more motivated toward their individual or small group goals than toward the organizational goals. Organization development (OD) could be the solution when the organization needs fixing — not the workers' behavior. The process reveals how individual and small group goals and those of the organization can and should overlap, resulting in a more effective organization.

Recognize Performance

How a reward and incentive system is structured affects job performance positively or negatively. If workers are to be motivated to put forth maximum effort, to do their best, reasonable wages must be provided and recognition, as well as other rewards, must be linked to performance.

The general level of wages received by workers and the differences in pay among them can lead to problems. Wage and salary administration ought to establish a justifiable rank order of different jobs and set wages that are logical and equitable. The content of jobs and the requirements necessary for proficient performance, not custom, favoritism, or an imprecise notion of the job's value in the workplace should determine the differential rates of pay.

Recognition and tangible rewards for accomplishments nurture and emotionally drive workers to expend additional energy. They contribute significantly to the overall well-being of any workplace.

Opportunities to get ahead in the organization are also important. There needs to be a rational systematic promotion plan that recognizes and rewards proficient performance and demonstrated potential.

Add Positive Discipline

Problems of human conduct or social relationships generally make themselves quite clear. Habitual lateness and absenteeism are problems that cannot be ignored. Lack of effort, laziness, and dishonesty are others. Patterns of belligerency; lack of respect for management, organizational rules, or policies; and trouble getting along with co-workers or customers also indicate that a reprimand or tactful discipline may be in order. When discipline is handled with impartiality and good judgment, the worker's performance will likely improve.

Only a small percentage of workers cause disciplinary problems. Furthermore, the reasons for such behavior may have nothing to do with the job. Family problems, chemical dependency, emotional difficulties, and financial or legal difficulties are often the root cause. Problem workers are expensive to have on the payroll and difficult to supervise. They tend to upset the morale of the work group. If a supervisor wants a worker to be more cooperative and productive, every effort should be made to deal with the underlying reasons for the unsatisfactory behavior.

Positive discipline begins with counseling, which includes (a) listening patiently to what the worker has to say, (b) refraining from criticizing or offering hasty advice, and (c) trying to determine if the worker is troubled by something deeper than what appears on the surface. Counseling interviews are aimed at helping workers unburden themselves. The payoff comes when the worker gains confidence in the supervisor and consequently doesn't vent resistance and frustration on the job (Bittel, 1974, pp. 286 & 404).

Use On-the-Job Coaching

Coaching involves on-the-job development where a supervisor supports an individual's progress through a planned set of learning experiences. According to research by the General Electric Company, 90% of employee development is done this way. While this may not be true in all organizations, it does emphasize that coaching is an important method for inspiring workers to improve their knowledge, skills, and attitudes.

Supervisors must identify specific things that workers can do to improve quality and productivity, then make a commitment to help in their accomplishment. They must take advantage of opportunities to guide workers to their full potential in an environment that motivates them to excel.

Summing Up

While examining situations where training is not appropriate, eight alternative interventions were presented. All things considered, training is an appropriate solution to job-related problems where workers have actual or potential deficiencies of knowledge or skill (Laird, 1985, p. 83). This can happen when (a) new workers are hired, (b) a worker is promoted or transferred, (c) new jobs are created, (d) existing jobs are to be performed in new ways, (e) new technology or equipment is introduced, or (f) there is a need to improve safety. However, before a decision is made to undertake training, planners ought to consider five more alternatives.

1. Change employee selection methods. This can increase the pool of skilled workers.
2. Improve job performance methods and use existing knowledge and skills more efficiently.
3. Assign workers to jobs that fully use their expertise.
4. Involve workers in planning, problem-solving, and decision-making that affects them.
5. Introduce new technology.
6. Reorganize and adjust priorities or change business practices.

The alternatives discussed and listed may be more efficient and/or cost effective than training would be. Consequently, determining the appropriateness of training is of paramount importance in building credibility with an organization.

Needs Assessment Methods

The best source(s) of accurate and complete information, whether documents or people, ought to be identified. This is true even if the source proves to be difficult to access or use because of expense, unavailability, or unwillingness.

Document Review

Workplace documents which can provide clues to problems as well as other pertinent information include: (a) employee records such as performance appraisals, absenteeism and turnover data, complaints and grievances; (b) position (job) descriptions; (c) strategic business plans and budget reports; (d) production and quality control records; (e) accident and critical incident reports; (f) regulatory requirements; and (g) exit interviews. Data can be collected from these and other documents without interrupting workers and asking them for information which is already available in workplace records and reports.

A check with the personnel department will reveal which employee records are accessible. Since privacy laws and regulations have become stringent, some of these records may be considered privileged information (Donaldson & Scannell, 1986, p. 24).

There are many methods and combinations of methods for collecting information from human sources. They run the full gamut, from an informal interview to a complex formal research design. Some of the best methods are:

1. Interviews (one-on-one and group)
2. Observations on the job
3. Survey techniques (questionnaires, checklists, rating scales, etc.)
4. Performance and achievement tests
5. Work samples
6. Advisory committees

Interviews

There are two main types of interview formats. The **one-on-one**, where the interviewer meets with an individual worker in person or talks with him over the telephone, is the more

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common type. Less common, but also effective, is a **group interview**, where the interviewer meets with several workers collectively. The group interview tends to elicit information that individuals might not bring up on their own. However, it may stifle honest discussion. Either of these formats can be structured, using prepared questions, or highly unstructured and informal, taking place over a cup of coffee or during lunch. If the conversation is initiated by the person being interviewed, so much the better. If not, tactful questioning should be used. Interviews can be quite effective at revealing causes of and possible solutions to problems (Donaldson & Scannell, 1986, p. 23).

A structured interview is more formal, generally occurring during a pre-scheduled meeting. Previously prepared questions usually solicit information concerning:

1. Problems encountered on the job
2. Improvements that could be made
3. Most- and least-liked parts of the job
4. Accomplishments on the job
5. Personal goals
6. Felt needs for acquiring additional knowledge or skills

It is extremely important that the questions and interview itself not be perceived as prying or playing a clandestine role. In addition, it is always necessary to respect the confidentiality of the responses. The advantages and disadvantages of the one-on-one (both in person and over the telephone) and group interview formats are presented in Appendix A.

Observations

Training needs can also be discovered with little or no interference with operational activities through on-the-job observations of worker performance. The observation can be as formal as a time and motion study or as behaviorally specific as watching a new worker operate a machine. It may be as unstructured as walking through an office and hearing overtones of conflict or misunderstandings between workers.

A complaint from a co-worker about telephone messages, outgoing correspondence, etc. may indicate a need for secretarial training. Observed problems such as poor housekeeping, hazards, time-wasting practices, and so forth may be traced to an ineffective supervisor or a need for training. Observations can be used to distinguish between effective and ineffective interpersonal, group, and intergroup behaviors; however, the presence of an observer may bias the behavior witnessed. Consequently, observations should be checked and verified by repetition or by comparison with those of other competent observers. The advantages and disadvantages of the observation method are listed in Appendix A.

Survey Techniques

Survey techniques range from simple response sheets to sophisticated questionnaires. Surveys are used to reach a large number of people, or people located over a large geographic area, in a relatively short period of time. A commonly used approach is to prepare a list of questions about training needs, and then solicit opinions from workers, their supervisors, and other stakeholders. The training needs are then identified by analyzing the data collected.

Since the resources (time and money) required to survey an entire population are often unavailable, a randomly selected or stratified sample may be surveyed instead. A variety of question formats may be used, including the open-ended, forced-choice, and priority-ranking types. Unfortunately, know-how, time, and hard work are required to (a) develop the questions, (b) write explicit instructions, (c) format and pilot-test the questionnaire, and (d) compile the information collected. See Appendix A for a list of the advantages and disadvantages associated with survey techniques.

Performance and Achievement Tests

Job task performance can be assessed through criterion-referenced performance tests. Pre-employment and periodic performance testing will reveal deficiencies in knowledge or skills, thereby establishing a need for training.

A comprehensive achievement test facilitates the process of "testing out". This makes it possible to eliminate repetitive training in knowledge and skills already attained. Additionally, it reveals the magnitude of the training yet to be accomplished.

Work Samples

Tangible samples of work such as management reports, or less tangible examples like how a manager conducts a meeting, can identify problem areas that require further analysis. This unobtrusive method provides direct information on the organization's actual work. It requires an analyst who is familiar with the work process and product standards.

Advisory Committee

A training advisory committee, composed of leaders representing key departments and committees/groups within an organization, can serve as a "sounding board" for new program ideas and act on training requests. Meeting agendas should be developed, distributed in advance, and followed. Decisions and recommendations should be recorded and brought to the attention of management. When involved in a positive and meaningful way, committee members will be the best advocates for training (Donaldson & Scannell, 1986, p. 25). Even though "has-beens" and semi-retired individuals can frequently be spared to attend meetings, they should not be included for obvious reasons.

Other Sources of Information

1. **Behavior assessment**. Instruments that measure the work behavior of individuals and groups include tests of attitudes, self-reports, opinionnaires, simulations, games, and other such devices.

2. **Consultations**. Discussions with colleagues in the same or a similar industry can also be helpful.

3. **Requests from management**. Because management support is needed for training courses and programs, these requests should be investigated, but not overreacted to. However, top-level management is the major information source regarding organizational strategy, current policies, and future expansion or down-sizing. Consequently, they may know what training will be required to fulfill these special needs.

Choosing a Method

Although all possible sources of accurate and complete information should be consulted to ensure a successful needs assessment, "criteria will vary for different organizations in different situations" (Blackburn, 1987, p. 48). Time schedules, resources, and costs must be considered in choosing which needs assessment method to use (Lampe, 1986; Kaufman, 1987). However, Lawrie (1986) maintains "data closest to a situation not only is most likely to be valid, but also has the best chance of being accepted" (p. 22) by both the selected workers and the organization.

The results of a study which surveyed human resource departments in America's top companies revealed that (a) **informal discussions** (interviews) was the most frequently used needs assessment method, and (b) **observations** was the next most frequent. One may have expected to find the more scientific needs assessment methods rated higher than the unstructured and informal interview. Nonetheless, even when a more formal method is used, experienced training professionals realize that "informal discussion is often needed to gain the necessary commitment from the clients to accomplish a project or program" (Ralphs & Stephan, 1986, p. 74).

Training needs can be either perceived (felt) needs or demonstrated (measurable) needs (Bowman, 1987; Lampe, 1986). Whichever the case, involving the intended trainees in determining their training needs "may have the largest impact on design decisions" (Lampe, 1986, p. 101). It is also important to solicit and listen to workers' ideas in order to "build [their] commitment to the training program" (Bowman, 1987, p. 32). When participating in the needs assessment process, workers should be assured that their responses are confidential and will be taken seriously by management (Abel, 1986).

After collecting information from the potential recipients of training, additional data can be collected from their co-workers, supervisors, and subordinates to get a comprehensive profile of training needs. When discrepancies are discovered among these different populations, the trainer should, if necessary, investigate further. Differing opinions sometimes indicate a communication problem within the organization, which provides another potential training need (Bowman, 1987).

Data should also be collected from top management, because they can provide pertinent information regarding the company's long-term goals and strategies. Furthermore, the success of a needs assessment often depends on the support of management. Research clearly indicates that the more management participates in the needs assessment, the greater the likelihood of their support (Abel, 1986; Bowman, 1987; Swanson, 1987).

Customers or clients are another source of valuable information. They often perceive problems in areas that insiders are not aware of (Lampe, 1986; Ralphs & Stephan, 1986).

Although training requests should certainly be acted upon, needs assessments ought to be conducted in a proactive mode as well as in a reactive mode. Assessing training needs should be an ongoing process, with the trainer always being on the alert to potential problems that can be prevented through training (Kaufman, 1987). Bowman (1987) asserts "programs [should] flow from the assessment, not assessment from suggested programs" (p. 30).

In instances where a needs assessment indicates more than one training need, the needs should be prioritized. Kaufman (1987) suggests assigning monetary values to each need "in terms of what it will cost to reduce or eliminate the need and what it will cost to ignore the need" (p. 82).

Preparing a Report

Once the training needs have been analyzed and prioritized, a report should be prepared and presented to management for approval and support. The report should contain (a) the purpose and objectives of the needs assessment, (b) methodology used, (c) data sources, (d) the analysis of information collected, (e) results, and (f) a recommendation as to the appropriate plan of action. Appendix B shows a worksheet that is useful in preparing a needs assessment report.

In Conclusion

The success of training begins with conducting a needs assessment. A properly conducted assessment actually saves time and money. It enables the organization to make informed decisions and to realize a return on the investment of resources. A needs assessment may provide erroneous information, however, if it is conducted in a "hit-or-miss" fashion. The result would be an inadequate and disappointing training course or program that reflected poorly on training as a profession.

A needs assessment should be properly conducted in a systematic manner to maintain training's professionalism and integrity and to gain respect from management as a profitable activity. Galagan (1986) asserts, "As training struggles to establish itself as a credible contributor to bottom-line results, it must be able to conduct, report, and justify effective needs assessment" (p. 4).

Training can't solve all problems — not all problems are training problems.

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APPENDIX A

Advantages and Disadvantages of Needs Assessment Methods

Advantages	Disadvantages
One-on-one (in-person) Interview	
• High response rate. • Individuals are generally more willing to talk than to fill out a questionnaire. • Misunderstood questions can be clarified. • Appropriate for jobs involving considerable personal judgment or mental application (intellectual tasks). • Yields precise, complete, and comparable information. • Additional information revealed through non-verbal messages (body language). • Appropriate with illiterates and those with language difficulties. • Responses can be recorded on audio tape or through written notes.	• Expensive and time-consuming to prepare for and conduct a number of individual interviews and compile the information collected. • Results depend upon the cooperation of those interviewed. • Can interfere with operational activities. • Requires a skillful, understandable interviewer with a pleasant personality and the ability to listen. • Individuals tend to say they do what they think they should do, not what they actually do. • Interviewer's bias, demeanor, and appearance can distort responses. • Requires a private, distraction-free setting. • Note-taking may be disturbing and audio-taping threatening to some individuals. • Scheduling interviews with busy individuals may be difficult. • Individuals may give conflicting information which must be reconciled.
One-on-one (telephone) Interview	
• High response rate. • Individuals are generally more willing to talk than to fill out a questionnaire. • Misunderstood questions can be clarified. • Appropriate for jobs involving considerable personal judgment or mental application (intellectual tasks). • Comparatively inexpensive. • Information collected on the job or at home in a short period.	• Less sensitive than in-person interviews. • Requires a trained, understandable interviewer with a positive attitude and good telephone manner. • Individuals tend to say they do what they think they should do, not what they actually do. • Reaching busy individuals to be interviewed or having them return a call may be difficult. • As the use of telemarketing increases, some individuals will hang up, not taking the time to distinguish between an interview and a solicitation.

Advantages	Disadvantages
Group Interview	
• Few people involved. • Misunderstandings can be clarified. • Participants generally find the activity to be a stimulating and rewarding experience. • Appropriate for jobs involving considerable personal judgment or mental application (intellectual tasks). • Information collected and verified in a short time. • Consensus can be reached on conflicting terminology or other points of disagreement. • Information provided by one individual can serve as a stimulus to others for recalling additional information.	• Full-time commitment, requires time away from the job, can be expensive. • Requires a recorder and a trained, understandable interviewer (facilitator) well-versed in group dynamics. • Requires knowledgeable individuals who are able and willing to communicate and cooperate as a group. • Presence of supervisors may affect job incumbents' participation. • Requires a distraction-free and comfortable setting.
On-the-job Observation	
• Accomplished directly by observer or indirectly with a motion picture camera or an audio and video tape recorder. Simultaneous recording of personal observations is recommended. • Finds out what incumbents actually do, not what they say they do. • Few individuals involved. • Little if any interference with operational activities. • Appropriate for jobs with observable psychomotor tasks, especially when an incumbent, even with assistance, cannot describe what is actually done and how it is done. • Best way to obtain an understanding of job context or environment.	• Time and safety factors may preclude direct observation. • Not able to observe all possible conditions. • Expensive and time-consuming to observe. • Presence of observer or recording device may cause stress and/or bias performance. • Ineffective for jobs involving considerable personal judgment or mental application. • Observations should be checked and verified, whenever possible, by repetition, or by comparison with those of other competent observers. • Requires a trained and knowledgeable observer who is patient and nonthreatening. • Methods oriented and slanted to the incumbent's way of doing things.

Advantages	Disadvantages
Survey Techniques	
• Useful when a large number of individuals perform the same job. • Appropriate for jobs involving considerable personal judgment or mental application (intellectual tasks). • Can survey a large number of geographically distant as well as mobile individuals economically by mail. • Yields large amounts of quantifiable information in a relatively short period. • Questionnaire can be completed, on the job or at home, at the individual's convenience. • Bias is eliminated on questions that could be sensitive or embarrassing when asked by an interviewer. • All individuals are asked the same questions in the same way. • Responses can be stored, manipulated, analyzed, and reported by a computer. • No need for trained observers or interviewers.	• Requires know-how, substantial time, and hard work to (a) develop questions, (b) write explicit instructions, (c) format and pilot the instrument, and (d) compile the information collected. • A comprehensive questionnaire may be unduly long. • Places a heavy demand on recall by those completing it. • Questions may be misinterpreted. • Some individuals may be distrustful and decline to complete the questionnaire or not provide honest, thoughtful responses. • May be returned incomplete or filled in by unintended or inappropriate individual. • Low response rate, especially when mailed and there is no monetary incentive or persistent follow-up. • Address may be incomplete or inaccurate and questionnaire may not be forwarded. • Does not facilitate further probing. • May require a computer to manipulate the large amount of information collected. • Inappropriate for low literacy groups.

APPENDIX B

TRAINING NEEDS ANALYSIS WORKSHEET

Requester: **Date:**

1. Task requiring improvement:

2. Frequency of task performance:

3. Consequences of improperly performed task:

4. Reason(s) task requires improvement:

5. Training recommendation(s):

6. Training action plan, if applicable (identify individual/department responsible for delivery of training and the delivery method recommended):

(Training Analyst) (Date)

Reviewed By:

(Training Manager) (Date)

(Requester) (Date)

(Supervisor) (Date)

☐ Approve Recommendation ☐ Reject Recommendation

If recommendation is rejected, identify an alternative solution:

Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Progress test No. 6

THE PERFORMANCE AUDIT

Directions: Each of the following items contains four (4) alternatives, one of which provides the **best answer**. Circle the letter which precedes the best answer.

NOTES

1. Why do organizations conduct performance audits?

   A. To increase the relevance and helpfulness of training to employees.
   B. To distinguish between problems that are solvable through training and those that are not.
   C. To find solutions for performance problems.
   D. All of the above.

2. A goal of the economic aspects of a performance audit is to

   A. decide whether economic benefits justify efforts to improve specific performances.
   B. reduce the extent to which training is based on economic factors.
   C. provide accurate estimates of training costs.
   D. substitute human behavior measures for economic measures.

3. When a manufacturer had a product quality problem, studies showed that machine operators were not able to make needed adjustments nor were they aware of quality-control results. Using the performance model, managers would probably conclude that

   A. a training program would be sufficient to solve the problem.
   B. employees needed training, quality-control results, and knowledge of concern about quality.
   C. quality standards would have to be changed.
   D. the problem could be solved most easily by replacing the workers.

4. Improving employee job performance is most likely to have a beneficial result when

   A. the best performer is currently much better than the worst performer.
   B. the best performer and the worst performer are currently nearly equal in performance.
   C. the contributions of different types and levels of employees cannot be determined.
   D. both the best and worst performers are very good.

Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Progress test No. 7

WORKFORCE PLANNING

Directions: Each of the following items contains four (4) alternatives, one of which provides the **best answer**. Circle the letter which precedes the best answer.

NOTES

1. An organization's plans for the development and use of human resources should

   A. increase productivity and profitability by concentrating on needs for specific skills and abilities.
   B. develop goals which combine meeting the organization's needs with efforts to promote individual growth.
   C. define individual growth goals only in terms of organizational needs.
   D. avoid the loss of efficiency resulting from attempts to interrelate individual and organizational goals.

2. The most important requirements for bringing about planned and systematic organizational change are

   A. the recognition of felt needs and the support of influential people.
   B. budgets and personnel exclusively devoted to change.
   C. numerous personal conflicts within the organization to justify change.
   D. emotional equality and fairness currently existing in the organization.

3. The Johari window, when used in career planning, rests on the assumption that

   A. organizational goals and individual goals are ultimately incompatible.
   B. communication of information between the organization and individuals is the least important aspect of career planning.
   C. manpower planning is a more important function than career planning.
   D. open two-way communication enhances interpersonal relationships.

4. Job posting

   A. is usually desired by management but resisted by employees.
   B. is an effective way to give employees control of their career planning.
   C. gives the organization full control over who will succeed to each position.
   D. is not recommended in organizations with formal career planning programs.

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Survey of Human Resource Development

The University of Tennessee
Progress test No. 8

INSTRUCTIONAL SYSTEMS

Directions: Each of the following items contains four (4) alternatives, one of which provides the **best answer**. Circle the letter which precedes the best answer.

NOTES

1. The most effective training programs are based on

   A. job-relevant behaviors.
   B. general principles of work effectiveness.
   C. behaviors that are not specific to a particular job.
   D. a content analysis.

2. In the early analysis of a proposed instructional program, the most critical step is

   A. establishing the body of information trainees will be required to learn.
   B. developing a task list of the behaviors desired.
   C. deciding on the methods and techniques to be used by instructors.
   D. assessing the training potential of proposed trainees.

3. When it has been decided to measure the trainees' level before they enter a training program, the goal should be to

   A. obtain an objective measure of potential ability.
   B. sample the entire range of aptitudes that apply to the trainees' positions.
   C. measure the extent to which trainees already possess the knowledge and skills to be trained.
   D. develop a measure that will accurately predict the instructional criteria.

4. A behavioral objective is a

   A. description of the overall goals of a training system.
   B. test used at the beginning and end of instruction to measure improvement.
   C. description of the desired behavioral action, performance conditions, and standards of attainment.
   D. description of the behaviors required of instructors to put the instructional system into practice.

Instructional Systems Development for Accountability

Clifton P. Campbell

Il est primordial d'assurer que le contenu et les résultats d'un cours de formation sont pertinents et utiles à l'étudiant. Aux Etats-Unis, on a même intenté des procès contre des institutions qui, allègue-t-on, n'ont pas réussi à préparer l'étudiant adéquatement pour le monde du travail. Une approche qui peut assurer la responsabilité est le ISD (en français: Elaboration des systèmes d'instruction). Les cinq étapes du système sont décrites: analyse, design, élaboration, mise en oeuvre et contrôle. A la fin, il est observé que ce processus est coûteux et compliqué, et qu'il importe d'en observer soigneusement toutes les étapes s'il doit réaliser tout son potentiel.

From time to time the news media carry disparaging stories which imply that vocational education and training is ineffective. Some well-intentioned educators also produce data to back up their arguments that certain programs are not effective. Unfortunately, we even hear of programs being criticized by the very students and employers they serve. The inference is that the full potential of vocational education and training to adequately prepare people for work is not being realized.

The public is in a mood to hold administrators and instructors accountable for instructional program results — or the lack of them. Malpractice suits have been filed, in the United States, claiming that schools failed to prepare students adequately for the working world. One consequence of this mood is that many concerned people are insisting upon structure and substance in instructional programs,[1] so that they are designed and carried out in a way that assures every student a base of skills, a body of knowledge, and unswerving attention to quality in teaching.

Years of debate by leaders in vocational education and training have not yet produced anything like a consensus on the best course of action for bringing about desirable changes. But many experts see cause for optimism in an approach, borrowed from government and industry, which is aimed at making instructional programs accountable for their results. This approach is called Instructional Systems Development (ISD). By definition, ISD is a deliberate and orderly process for planning, developing, implementing and evaluating instructional programs which ensures that students are taught the knowledge, skills and attitudes essential for successful job performance.

The accountability of instructional programs is virtually certain when the principles and processes of ISD are used. This is because the derivative and iterative character of the methodology ensures, when its procedures are faithfully carried out, that instruction meets job requirements.

Parts of this methodology have been used by vocational educators and trainers for some time, But, the ISD process itself has only recently been refined into detailed procedures which are useful to curriculum developers, instructors, administrators and teacher trainers. This article will describe these procedures and provide the reader with the framework for a quick understanding of ISD. It simplifies and compresses into a digest what is included in each phase of the ISD model.

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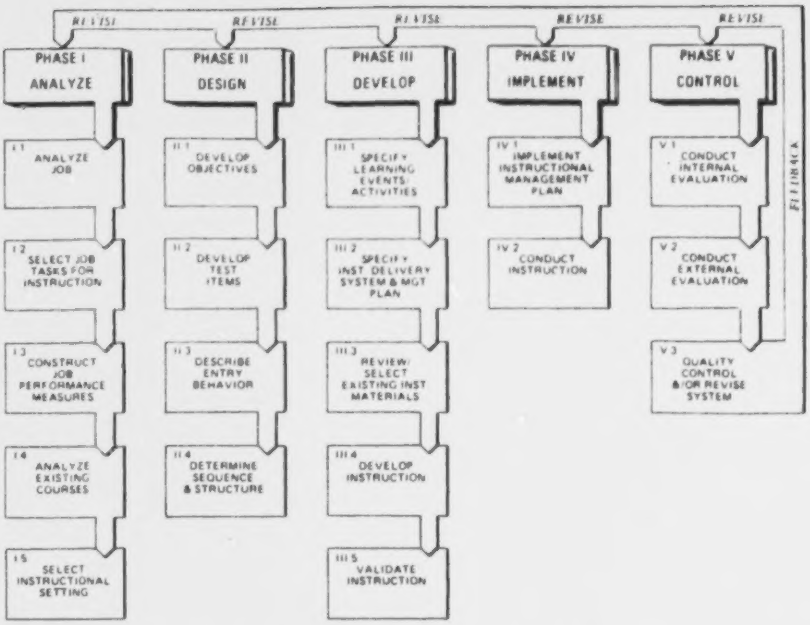
[1] The term *instruction* can be read as education and/or training.

Background

The ISD approach for the development and accomplishment of vocational education and training programs provides a methodology for gathering and analyzing job information, developing instructional materials and media, conducting instruction and evaluating and improving the effectiveness of instructional programs. This approach is based upon evidence that each task/behavior performed on a job can be identified and analyzed and that appropriate learning objectives and instructional strategies to achieve these objectives can be developed and structured so that instruction will be efficiently and effectively conducted. The application of the systems approach to instructional development ensures that all interrelated factors are considered and that the students, when the instruction is appropriately delivered, will reach performance standards required for specific job entry level proficiency.


REVISE
REVISE
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REVISE
PHASE I
ANALYZE
PHASE II
DESIGN
PHASE III
DEVELOP
PHASE IV
IMPLEMENT
PHASE V
CONTROL
I 1
ANALYZE JOB
I 2
SELECT JOB TASKS FOR INSTRUCTION
I 3
CONSTRUCT JOB PERFORMANCE MEASURES
I 4
ANALYZE EXISTING COURSES
I 5
SELECT INSTRUCTIONAL SETTING
II 1
DEVELOP OBJECTIVES
II 2
DEVELOP TEST ITEMS
II 3
DESCRIBE ENTRY BEHAVIOR
II 4
DETERMINE SEQUENCE & STRUCTURE
III 1
SPECIFY LEARNING EVENTS/ ACTIVITIES
III 2
SPECIFY INST DELIVERY SYSTEM & MGT PLAN
III 3
REVIEW/ SELECT EXISTING INST MATERIALS
III 4
DEVELOP INSTRUCTION
III 5
VALIDATE INSTRUCTION
IV 1
IMPLEMENT INSTRUCTIONAL MANAGEMENT PLAN
IV 2
CONDUCT INSTRUCTION
V 1
CONDUCT INTERNAL EVALUATION
V 2
CONDUCT EXTERNAL EVALUATION
V 3
QUALITY CONTROL &/OR REVISE SYSTEM
FEEDBACK

INSTRUCTIONAL SYSTEMS DEVELOPMENT MODEL AND FLOWCHART

FIGURE 1

Model for Instructional Systems Development

Instructional Systems Development consists of five major phases: I) Analysis, II) Design, III) Development, IV) Implementation, and V) Control. Each is a separate and distinct function. The ISD procedural model and flowchart, exhibited in Figure 1, shows these phases, each of which is further divided into a number of blocks or steps. Symbolically, this structure outlines the recommended relationship of the nineteen procedural steps. It also provides a graphic portrayal of the interrelationships between all the phases and blocks which form a closed loop instructional system. Components of the model are necessarily depicted in a linear sequence. In practice, some of the steps may be conducted concurrently while others must be done sequentially.

Phase I, Analyze

Before designing and developing instruction it is necessary to establish what constitutes adequate job performance. Job analysis is the basic method for identifying and describing the tasks and elements necessary to perform a clearly defined, specific job. It can involve any or all of the techniques of questionnaire surveys, jury of experts, personnel interviews and observations in the work environment, and reviewing job task lists from occupational surveys. Regardless of how well all the other procedural steps are carried out, if job analysis data are not valid and reliable the resulting instructional program will fail to produce graduates who can perform successfully on the job.

Some tasks are seldom required on the job and only minimum job degradation would result if they were not performed. However, other tasks may be highly critical to successful job performance, and the complex nature of the task makes instruction essential. Economic, time and other considerations require a decision as to which tasks are selected for instruction and which are not. Selection criteria and information collected during the job analysis are used in making this decision.

Job performances measures are constructed for tasks selected for instruction. In addition to evaluating a job incumbent's task proficiency, job performace measures are used in writing learning objectives (block II,1), in preparing test items (block II-2) and in measuring the performance of graduates on the job (block V.2). Because of their multiple uses, job performance measures are fundamental to the development and control of instruction. However, while worthwhile, they are costly to develop.

In order to avoid unnecessary duplication of effort, existing course documentation and other available material should be examined. This effort may reveal that all or portions of the analysis and other phases have already been done by someone else.

As a final step in phase I, the tasks selected for instruction are analyzed in order to identify the most appropriate instructional setting(s). e.g., classroom and/or shop instruction, on-the-job training, etc. The optimal setting is the one that provides the necessary equipment, facilities and pesonnel as well as the most effective and efficient instruction. It should be noted, however, that settings are usually selected by higher authority and trade-offs are frequently made based on resource availability and other constraints.

Figure 2 shows the sequence of events required in the analysis phase of course development. Event outputs are listed alongside in terms of products.

Phase II, Design

Beginning with this phase the model is concerned with designing instruction using the products from Phase I. The first step is the conversion of each task selected for instruction into a terminal learning objective. Job performance measures provide the basis for developing these terminal learning objectives.

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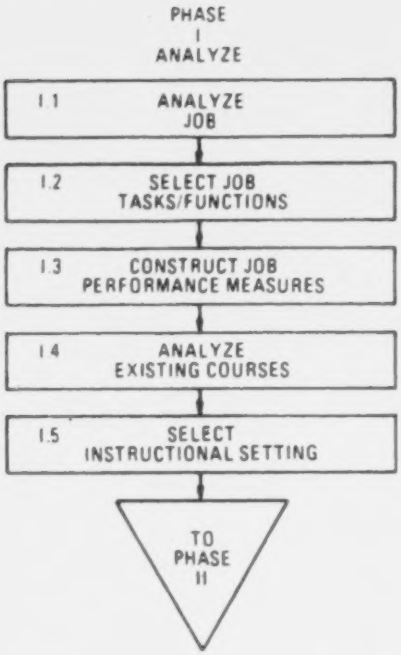
EVENTS:


PHASE
I
ANALYZE
1.1 ANALYZE JOB
1.2 SELECT JOB TASKS/FUNCTIONS
1.3 CONSTRUCT JOB PERFORMANCE MEASURES
1.4 ANALYZE EXISTING COURSES
1.5 SELECT INSTRUCTIONAL SETTING
TO PHASE II

PRODUCTS:

1.1	a list of job tasks, the equipment and or materials involved, the conditions and standards of performance, etc.
1.2	a list of tasks selected for instruction
1.3	a validated job performance measure for each task selected for instruction
1.4	an examination of the job analysis, task selection and job performance measures for any existing instruction to determine if these courses are usable in whole or in part
1.5	selection of the instructional setting for tasks selected for instruction

FIGURE 2

Learning objectives (both terminal and enabling) must realistically describe the knowledge and skills that are to be mastered by the student. They are the common three part objective that provides a statement of the behavioral actions, performance conditions and attainment standards which can be measured within the learning and testing environment.

Each terminal learning objective is subjected to a hierarchical analysis to derive intermediate (enabling) objectives. These enabling objectives provide the level of detail necessary to specify the behavioral elements and the skills and knowledge that mediate a terminal objective.

Learning objectives bridge the gap between performing a task under job conditions and learning how to perform that task in an instructional setting. Precisely stated learning objectives serve as a control over the content and output of instruction. They define for the student, instructor, curriculum developer and test writer exactly what is required of them.

After all the learning objectives have been prepared, test items to measure student attainment are written. These test items are called criterion referenced measures because they test against the criteria for successful performance that were identified in the objectives. With a criterion referenced measure, students are rated on their ability to achieve the objectives. How others score on a test has no bearing on an individual's grade. Sufficient items should be written on all learning objectives to allow for alternative forms of a test in order to facilitate retesting. The grouping of test items into pre-tests, progress tests and a post-test is done in block II.4.

Once the test items have been developed, those that were designed for lower level enabling objectives should be administered to a representative sample of the incoming student population, in the form of an entry level test, to measure entry level behavior. Entry level behavior includes the skills, knowledge and attitudes students possess at the time they report for instruction. Estimates of student capabilities will be verified or adjusted according to test results. When the test shows that some of the enabling objectives upon which test times are based have already been mastered by the students, those enabling objectives and their corresponding test items should be deleted from the course. Whenever the test indicates that students lack the prerequisite knowledge and/or skills, additional learning objectives and test items must be developed to fill the gap between entry level assumptions and the true entry level required for the course. No modifications are necessary when the test accurately measures the students' entry level behavior.[2] Entry level behavior may also be assessed when actual instruction begins. Changes in entry population capabilities can be determined in this way.

Finally, the refined list of learning objectives, both terminal and enabling, are sorted, sequenced and grouped. This is usually done on the basis of commonality of subject matter and anticipated transfer of learning. The sequence is determined primarily by the dependent relationships among training objectives. Independent and coordinate objectives are sequenced in accordance with such principles as simple to complex, familiar to unfamiliar, and job order.

Because test items mesure specific learning objectives, they are structured at the same time as the learning objectives. This greatly facilitates the grouping of test items into pre-tests, progress tests and a post-test.

The sequence of events in the design phase is illustrated in Figure 3. The products of each event are also listed.

Phase III, Develop

The instructional development phase begins by identifying the learning activities which must take place in order to produce the desired learning outcomes. The purposes of block III.1 are to: 1) classify the learning objectives according to the appropriate learning categories and sub-categories (see Table 1), 2) identify for each subcategory those learning guidelines necessary for optimum learning to take place (see Table 1), and 3) specify activities that must take place in the learning environment to provide instruction directly related to task performance.

The four learning guidelines listed in Table 1 seem to apply to most of the learning categories. However, each learning sub-category does not require all or the same learning guidelines for

---

[2] Results for each test item will probably show that some students already know the material while others do not. It is unlikely that everyone tested will either know all of the material or not know it. Therefore, in establishing an entry level for a group paced course, curriculum developers must use their best judgment in determining the exact level of instruction at which to begin the course.

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optimum learning to take place. The purpose here then is to select those guidelines which best enable the student to master the learning objective. Based on the learning guidelines selected, as well as the learning objectives and test items, it is possible to identify what the instructor or instructional materials must do to teach a student to perform the learning objectives and also what the student must do to show mastery of the subject matter.

The procedures in block III.2 involve two principal steps. Step one is the specificaton of an instructional delivery system which provides the optimal combination of instructional methods, media and organizational system to accomplish the terminal objectives. However, since there is no single best method of teaching which applies to all learning situations or objectives, the instructional delivery system will normally include a combination of teaching methods, selected instructional media and a system of organizing students and instructors, to accomplish an objective. The selection of one delivery system over another, therefore, is made on the basis of careful analysis of the instructional situation from several standpoints: 1) learning objectives, 2) course content, 3) student population, 4) instructional staff, 5) space, 6) equipment and facility constraints, 7) instructional materials, 8) time and 9) costs. Consequently, the instructional delivery system must be compatible with the learning objectives selected in block II.1, the learning activities selected in block III.1 and any other significant inputs from previous blocks in the model.

The second principal step is the preparation of an instructional management plan which is a set of procedures used to assure a smooth flow of students through the instructional system. This plan indicates exactly how the course is to be conducted, how the students are to be managed, when and where they will be tested, what the instructors and other support personnel are to do and how each of the many elements within the plan work together.

Developing instructional materials is both costly and time consuming. Therefore, it is essential to search out and consider the usefulness of existing materials before committing resources to the development of new instruc-

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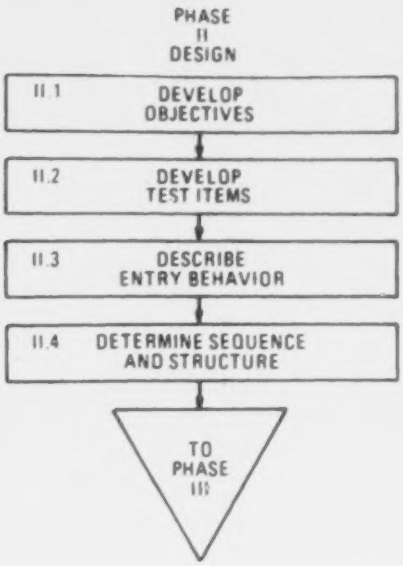

PRODUCTS:

II.1 learning objectives, both terminal and enabling

II.2 a pool of criterion referenced test items which measure each learning objective

II.3 test(s) to establish student entry behaviors and, when necessary, revisions to learning objectives and test items based on true entry levels

II.4 a list of sequenced and structured learning objectives

FIGURE 3

Table 1
LEARNING CATEGORIES AND SUB-CATEGORIES

Learning Categories	Learning Sub-Categories
I. Mental skill	1. Rule learning and using 2. Classifying-recognizing patterns 3. Identifying symbols 4. Detecting 5. Making decisions
II. Information/knowledge	6. Recalling bodies of knowledge
III. Physical/manual skills	7. Performing gross motor skills 8. Steering and guiding-continuous movement 9. Positioning movement and recalling procedures 10. Voice communicating
IV. Attitude	11. Attitude learning

Source: NAVEDTRA 106A, Phase III Develop, p. 11

LEARNING GUIDELINES

1. *Inform Student(s) of Learning Objectives.* At the beginning of each lesson the instructor will state the terminal objective. The learning objectives will also be specified in written materials.
2. *Provide for Active Student Practice.* Whenever possible, write learning activities that call for active responses from the student(s). Have them do something to show that they understand the subject matter.
3. *Provide Guidance and Prompts to Student.* Give student(s) sufficient examples of what to do and explanations of how to do it so that they know what is expected of them.
4. *Provide Student(s) with Feedback.* Tests should be used as teaching tools by fairly testing attainment of the objectives and providing student(s) with either reinforcement for correct answers or an explanation of their mistakes. Regular classwork should also be written to provide the student(s) with feedback on their performance.

Source: NAVEDTRA 110, p. 105

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tional materials. Candidate materials should be examined to determine whether they can be used or adapted for use.

In block II.1, learning objectives were derived for each task selected for instruction. In block III.1, specific learning guidelines and learning activities were identified that require different instructional treatment. From block III.2 the media and methods of instruction have been specified and from block III.3 the acceptable off-the-shelf instructional materials have been assembled. At this point all the preceding analysis and planning will be utilized to produce the necessary additional instructional materials.

The production process includes developing draft materials using the learning activities specified in block III.1. These materials are tried on students, revised as necessary, and finally sent to the appropriate production specialists for development. A variety of approaches are available for use. The appropriate mix of these approaches will depend in large part on the available time and the facilities and resources that can be used. Lectures, video tapes, slide/tape presentations, job performance aids, and formal on-the-job training are all developed according to the same general principles. The prescribed procedures allow for ample internal content review of the materials to ensure that they are doctrinally correct.

The heart of the development phase is the validation of instructional materials until the students who use them as planned meet the learning objectives.

If the instructional materials selected in block III.3 and those developed in block III.4 have been produced efficiently, they will have the minimum possible elaboration. The instruction should be "lean" to ensure the economies of minimal instruction. When this material is tried on students for the first time, it should reveal some short-comings. These inadequacies can be corrected through the process of revision. If, on the other hand, tryout reveals only a few errors and difficulties, and students seem to grasp everything quickly, it is likely that the instruction has been overdone.

Selected members of the target population usually go through the materials individually at first and revisions are made on a basis of those trials. Then the number of students is increased in order to detect more possible errors. Finally, when the materials are thought to be complete, they are tested on a sufficient number of students to demonstrate their effectiveness at an acceptable level of confidence.

As the materials are improved, fewer students will encounter difficulties, and more students will work through them to an acceptable level of performance. At this point the instructional materials are ready for quantity reproduction and implementation.

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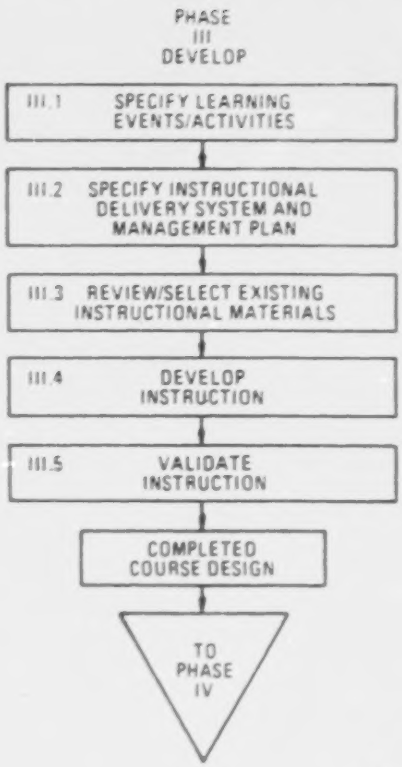
PHASE
III
DEVELOP
III.1 SPECIFY LEARNING EVENTS/ACTIVITIES
III.2 SPECIFY INSTRUCTIONAL DELIVERY SYSTEM AND MANAGEMENT PLAN
III.3 REVIEW/SELECT EXISTING INSTRUCTIONAL MATERIALS
III.4 DEVELOP INSTRUCTION
III.5 VALIDATE INSTRUCTION
COMPLETED COURSE DESIGN
TO PHASE IV

PRODUCTS:

III.1 the classification of learning objectives by learning category and sub-category as well as the determination of appropriate learning guidelines and activities

III.2 an instructional delivery system and supporting media as well as the instructional management plan for conducting the instruction

III.3 selected existing instructional materials adequate for use and materials which must be revised before use

III.4 the development of instructional materials for all objectives where existing materials are not available

III.5 validated instructional materials

FIGURE 4

Figure 4 illustrates the sequence of events in the development phase. Event products are listed alongside the chart.

Phase IV, Implement

The implementation of the instructional management plan is the terminal step in planning and preparation and occurs just before instruction begins. It is at this point that any discrepancies or deficiencies in the materials, procedures, tests and other necessary components of the total instructional program are identified and corrected.

It is also necessary at this time to make sure that the instructors and other key personel are adequately trained in the techniques or procedures with which they are not familiar. The emphasis is on assuring that the right people are at the right place at the right time, that they know what they are supposed to do, and that they have the materials, equipment, facilities and other resources necessary to do it.

A complete instructional package containing learning objectives, tests, instructional materials/instructional management and a trained staff should now be available. What remains to be done is to conduct instruction in accordance with the procedures and documentation contained in the instructional management plan. As part of the instructional activity, required changes and other observations are documented. Records are also kept on evaluative data and problems students have with instructional materials. At the completion of each course cycle, the collected information should be used to improve instruction for the succeeding cycle.

The sequence of events for the implementation phase is shown in

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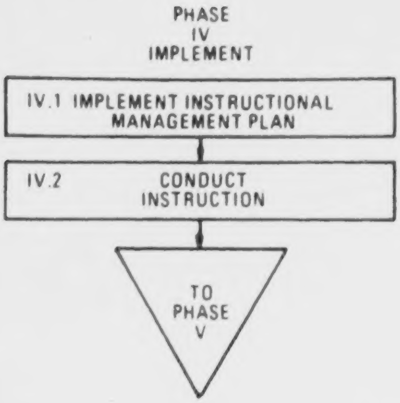

PRODUCTS:

IV.1 documents containing information on time, space, student and instructional resources and staff trained to conduct the instruction

IV.2 a completed cycle of instruction with information needed to improve it for the succeeding cycle

FIGURE 5

Figure 5. Event outcomes are also listed in terms of products.

Phase V, Control

This phase provides for the evaluation and revision of instruction. The first activity, internal evaluation, is conducted to determine if the instruction is providing students with the necessary knowledge and skills to meet the learning objectives developed in Block II.1. This is accomplished by assessing student test performance and evaluating the effectiveness of instructional materials, media and methods. The internal evaluation process consists of collecting pertinent performance, progress and process data and information from students, instructors and other informed personnel, evaluating this data and formulating recommendations.

External evaluation occurs when graduates are on the job. It uses job performance as the standard to evaluate proficiency and the adequacy of the instructional process. In a sense this revalidates the original task list. External feedback is usually obtained by following graduates into the field either physically or by questionnaire. The most reliable and costly external feedback is gained by administering the job performance measures produced in block I.3. As with internal evaluation, external evaluation is a continuous process which identifies problems and recommendations for improvements/revisions to instruction.

The final function in the ISD process is that of maintaining quality control of the instructional program through the process of revision. Since a considerable amount of effort has gone into the design and development of an instructional program, the decision about what to revise, if anything, should be made only after careful analysis of the inputs from blocks V.1 and V.2. Generally, revision means those changes made in the procedures, techniques and materials in the program. The emphasis is usually on change of technique rather than of content, doctrine, or curriculum.

Figure 6 shows the sequence of events for the evaluation and quality control phase. Event products are also listed.

Commentary

ISD is a methodology for making vocational education and training programs accountable for their results. This is possible because ISD ensures that instruction is relevant to the job. Its iterative and derivative character virtually assures that instruction will meet job requirements if procedures are conscientiously executed. However, ISD procedures are difficult, time consuming and costly to carry out. Consequently, ISD will be worth the cost and effort only to the extent that it is implemented so as to realize its potential.

The extent to which users adhere to the ISD process and actually use its products in designing training is subject to question. In practice, steps are sometimes omitted and the class connection between components, that is essential to make the process truly derivative, is not maintained. Most important, the testing and revision necessary to ensure job relevance generally do not occur. When this happens the potential of ISD to ensure that instruction meets job requirements is not being realized. Efforts to implement ISD should therefore concentrate on maintaining the integrity of the model by guarding against omissions in the process and failure to use its products.

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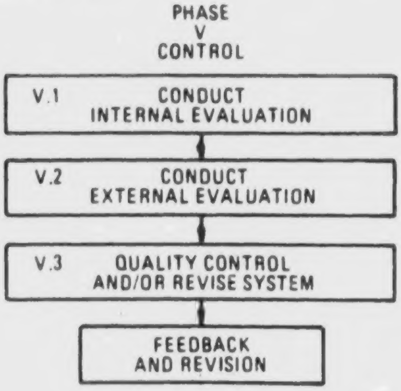
PHASE
V
CONTROL
V.1 CONDUCT INTERNAL EVALUATION
V.2 CONDUCT EXTERNAL EVALUATION
V.3 QUALITY CONTROL AND/OR REVISE SYSTEM
FEEDBACK AND REVISION

PRODUCTS:

V.1 a report on evaluation findings, their interpretation and recommendations for revisions

V.2 a report on the evaluation procedures, findings, interpretation and revision recommendations

V.3 instructional program revised on basis of empirical data

FIGURE 6

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Handbook for Designers of Instructional Systems (Planning, Developing, and Validating Instruction) (AFP 50-58, Vol. IV) Washington, D.C.: Department of the Air Force, July 1978.

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Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Progress test No. 9

USING EXTERNAL RESOURCES

Directions: Each of the following items contains four (4) alternatives, one of which provides the **best answer**. Circle the letter which precedes the best answer.

NOTES

1. Who has the primary responsibility for determining what changes in job performance should occur?

   A. Trainer
   B. Line organization
   C. External training resource
   D. Trainees

2. The best way for a trainer to deal with the identification of training needs is to

   A. periodically circulate check-off lists of courses available.
   B. wait for line managers to initiate training requests because these requests reflect true problem areas.
   C. choose educationally sound courses and locate problem areas in the organization they will help solve.
   D. systematically and continually collect data to help identify problem areas.

3. Tailoring programs from external resources to specific local needs is easiest

   A. with prepackaged media presentations.
   B. for traditional courses in which objectives are not specifically defined.
   C. when training needs and course objectives are defined behaviorally.
   D. for computer-aided instruction.

4. In deciding on class size for programs provided by external resources,

   A. it is often necessary to compromise between the small class size desired by line managers and the large classes desired by the external resource.
   B. facilities and equipment should not be allowed to limit class size.
   C. classes should be as large as physically possible so all trainees can be accommodated in the fewest sessions.
   D. it is often necessary to compromise between the large class size desired by line managers and the small classes desired by the external resource.

THE SELF-PACED LEARNING ENVIRONMENT

INTRODUCTION

A self-paced learning environment, or learning center, is more than a physical location; it is the embodiment of the fundamental principles of learning. In most cases, a learning center requires both a computer system and carefully designed instructional materials in various forms.

This information sheet introduces the basic characteristics necessary to maintain the optimum learning environment for trainees. The learning objectives are:

1. LIST three distinguishing characteristics of individualized instruction, without the use of an aid and with no errors.

2. LIST three characteristics of self-paced instruction, without the use of an aid and with no errors.

INFORMATION

The characteristics of individualized instruction form the basis of the self-paced instruction that occurs in a learning center. The three distinguishing **characteristics of individualized instruction** are:

1. It is designed to recognize each trainee as a unique individual.
2. It facilitates trainee admission to a course or program at numerous points in time.
3. It enables trainees to choose the instructional media which best suits them.

To individualize instruction fully, the presentation of instructional media must be tailored to the individual trainee. Some trainees learn best by listening, others prefer visual images. Some trainees absorb things well by reading. **Notwithstanding all these learning styles, most trainees learn by doing**, trying things out and actively getting hands-on practice.

Ideally, individualized instruction offers instruction in a host of media. Print, videotape, motion pictures, audio tapes, slides, and other instructional media would all be available. The purpose of the variety is to let all trainees select the medium or media that they find most suitable for their personal learning style. Apart from being ideal, providing instruction in all possible media is unrealistic. Such an approach would require that each lesson topic be developed in every possible medium. It would require that every trainee receive a custom-tailored course. Few, if any, organizations can provide the unlimited resources that would be involved in such custom tailoring.

As trainees go from assignment to assignment, they should have a choice of instructional media. The choice need not be unlimited, however. Instead, media options are designed into a course or program based on the needs of the content and projections about the nature of the trainees. Considerations of training needs like these allow course designers to develop optimum media mixes that give most trainees the media that will serve them best. Moreover, offering media choices used by only a small number of trainees is not cost effective.

The three **characteristics of self-paced instruction** that incorporate the most positive features of individualized instruction are:

1. Trainees can progress from assignment to assignment at their own rate of speed, within reason.

2. Trainees may challenge (take) a test at any time.

3. Trainees may complete a course or program in different amounts of time, depending upon variables such as their skill and knowledge.

Under the first characteristic, trainee rates of progress are kept "within reason" by using Predicted Completion Time (PCT). PCT is calculated before trainees begin a course of program, based on factors which influence their entry level. Instructors use comparisons of PCT to actual time spent in a course to monitor trainee progress.

REVIEW QUESTIONS

Directions: Study the information on this sheet. Then, without the use of an aid:

1. List three distinguishing characteristics of **individualized instruction**.

1.1 ______________________________

____

1.2 ______________________________

____

1.3 ______________________________

____

2. List three characteristics of **self-paced instruction**.

2.1 ______________________________

____

2.2 ______________________________

____

2.3 ______________________________

____

Human Resource Development

The University of Tennessee
Information Sheet

INDIVIDUALIZATION OF INSTRUCTION

Pace, Content, Sequence, and Style of Instruction

Instructional systems combine organized collections of subject matter content with appropriate procedures for presenting the content to bring about learning outcomes. In individualized systems of instruction, the pace, content, sequence, and/or style of instruction are adjusted to the needs of individual learners.

Pace

Pace refers to the rate at which individuals progress through instructional content. It may be individualized in either or both of two ways. First, pace may be individualized by allowing individuals to proceed as rapidly as they can comprehend the material or as slowly as they wish through a set of instructional items.

Second, different numbers of items may be presented to different individuals. In this situation, items may be randomly generated by computer or the instruction may involve simulation of a device or situation. It may also occur when items are repeated or sampled from a fixed quantity. When different numbers of items are presented, pace may be further individualized through the rate with which new instructional content or levels of difficulty are introduced.

Content

Content is usually individualized through a diagnostic-prescriptive process. The individual's knowledge and skills are assessed prior to initiating work in any component of instruction. Components may range from the entire program of instruction, to a unit, or to a single item. Based on the results of the assessment, content is diagnostically adjusted to the individual's needs by prescribing that he/she skip the component entirely, study remedial material before working on it, or begin work in one or more "tracks" within the component itself.

The assessment and instructional stages are not necessarily distinct. In some implementations, as the individual receives instruction, procedures built into the system adjust the content and its presentation in accordance with that individual's performance and estimated knowledge.

Sequence

Individualization of **sequence** can occur at two levels. At a macro level it concerns the order of topics addressed by the instruction. Implementations at this level may involve individual control, whereby the sequence of topics is determined by each individual learner. Alternatively, the instructional sequence may be determined in conference(s) between the individual and instructor or other system coordinator, or it may be determined solely by established procedure or algorithm.

At a micro level, individualization of sequence determines the order in which items are presented. The sequencing of items may be unique for each individual, but it is not tailored to personal needs or interests. Applications at this level may simply present items in an arbitrary or random order.

Style

The manner in which different individuals receive, process, store, and recall information may differ. These differences have been called cognitive styles. Instructional systems that try to adjust to these differences are said to provide individualization of **style**. In practice, individualization of style usually involves adjusting the method of delivery. For example, instructional content may be presented using printed materials alone, audiovisual media alone, or some combination of the two that is consistent with the cognitive style of the individual.

Individualization of style is not as widely utilized as individualization of pace, content, and sequence. In addition, the literature suggests that it is less expensive and more efficient for individuals to adjust their learning style to instruction than for instruction to adjust its style to learners, but research has not yet settled the issue. Brent (1990) and Federico and Landis (1984) summarize much of the research on cognitive style and report data suggesting that individualization of style is beneficial to learners, but that **the extent of these benefits depends on the learning objectives and instructional content.**

Recapturing the Effectiveness of Tutoring Without the Cost

The practice of grouping students together in a classroom took hold during the Industrial Revolution. While **group instruction made mass education and training economically and administratively feasible**, it was at the expense of the individualized tailoring of instruction provided by one instructor working with one student. Bloom (1984) characterized this issue as the "2-sigma problem." He found that when instructional time is held constant, **students in a conventional classroom (with about 30 students and one teacher) score about two standard deviations lower than students given individual tutoring.**

Bloom defined the challenge for individualized instruction as one of recapturing the two standard deviations of achievement lost by group instruction. Accordingly, **individualized systems of instruction can be viewed as attempts to recapture the effectiveness of individual tutoring without the expense.**

Technological Contributions

Technology's first significant contribution to instruction occurred in the 1400s with Johannes Gutenberg's development of movable type and printed books. These developments made instructional content affordable to large numbers of people.

A second significant contribution of technology to individualized instruction occurred with the development of stored-program computers. Computers have made not only the content but also the interactions of effective instruction inexpensively available to large numbers of people.

Computers implement the procedures for presenting instructional content that are key to individualization of instruction. However, Clark (1983) reminds us that "computer-based instruction" is too diffuse a term to describe any particular system or approach to instruction.

The following discussion considers **print-oriented** and **computer-oriented** approaches to individualized instruction. Print-oriented approaches emphasize the use of paper (hard copy) materials, while computer-oriented systems capitalize on the promise of computer technology. Both approaches may use printed materials; the differences between the two primarily concern the amount of work performed by computers.

Individualized Instruction: Print-Oriented Approaches

Print-oriented approaches, such as modules, divide instructional content into units of instruction. Then, for each unit, they provide a pre-assessment (pre-test), an individualized prescription and presentation of instructional content based on the pre-assessment, the instruction itself, and a post-assessment (post-test). Students must attain criterion levels of knowledge and/or performance on the post-assessment before progressing to the next unit of instruction.

Programmed Instruction

Development of programmed instruction was directly influenced by B.F. Skinner's paper, "The Science of Learning and the Art of Teaching" (1954). His "extrinsic programming" breaks instructional material into a linear series of steps requiring learners to make active responses for which they receive immediate feedback. The steps are intended to be so small that the individuals' responses are almost always correct. Neither the content, sequence, nor style of presentation are adjusted for individual learners, but individuals determine the pace at which they complete the items and progress through the material.

Despite Skinner's impact on programmed instruction, most applications of this approach are closer to the "intrinsic programming" described by Crowder (1962) and commonly used in programmed texts and tutorial computer-based instruction. Intrinsic programming is a pragmatic compromise between the difficulties and expense of devising Skinnerian extrinsically programmed materials and the inflexibilities of group instruction.

Intrinsic programming permits larger instructional steps than extrinsic programming, but it still emphasizes active responding and immediate feedback to learners. All responses, correct or incorrect, can be examined and used to determine paths for continuing instruction. Intrinsic programming requires instructional developers to anticipate the wrong responses likely to be made by individuals and the remedial material needed to correct the misconceptions and provide information they lack. In this way, intrinsic programming can support individualization of pace, content, sequence, and style.

Hartley (1977), Kulik, Cohen, and Ebeling (1980), and Kulik, Schwalb, and Kulik (1982) have all reviewed research findings on the effectiveness of programmed instruction, although they did not distinguish between extrinsic and intrinsic programming. Hartley reviewed results from 89 studies of elementary and secondary school mathematics instruction and reported an average improvement of 0.11 standard deviations through the use of programmed instruction.

In a review of 57 studies, Kulik et al. (1980) reported that programmed instruction used in higher education to present a variety of subjects improved performance by about 0.24 standard deviations over conventional instruction. In a review of 47 comparisons, Kulik and others (1982) reported that programmed instruction used in secondary education to present a variety of subjects improved performance by about 0.08 standard deviations. Overall, these **results suggest that the positive impact of programmed instruction is genuine, but limited.**

Programmed Texts and Teaching Machines

After instructional content has been programmed, it must be presented to the student by means of some type of "holder," such as a programmed text or teaching machine. Programmed texts and teaching machines are, however, limited primarily to teaching knowledge-level material. Teaching manipulative skills requires the use of actual job equipment or a simulator. It is also important that skill training take place in an environment which duplicates the operational environment as closely as possible.

Many authorities are convinced that a programmed text is sufficient for most programmed instruction. Such texts have been developed for a wide variety of subjects, including mathematics, electricity-electronics, foreign languages, accounting, management, computers and data processing, and medicine.

A teaching machine is a mechanical or electronic device that presents instructional content to students on an individual basis. Students have their own machines and receive instruction as fast as they can absorb it. Assuming, of course, that the student needs the instruction to begin with, machines provide instruction which is both individualized and self-paced.

Teaching machines are produced with varying degrees of complexity and special features; however, they all represent some form of tutorial teaching. They present each student with problems, exercises, questions, and answers.

The difference between teaching machines and most other individual instructional methods is that teaching machines provide immediate feedback to students. Errors can be corrected immediately because students are made aware of their progress during each phase of instruction. Thus, teaching machines differ from other media in three ways:

1. Students must respond continuously and actively, providing explicit practice and testing of each step of what is to be learned.

2. Students receive immediate feedback on their responses, so that errors can be corrected.

3. Students proceed on an individual basis at their own pace -- faster students advancing rapidly through an instructional sequence, slower students being tutored as slowly as necessary, with infinite patience to meet their special needs.

The nature of teaching machines and programmed instruction provides a channeling of student activity into a relatively narrow chain of experiences. Only a small portion of the lesson is available at any one time, so students cannot advance or regress unless that action is programmed into the lesson or machine.

In presenting a program, a teaching machine provides immediate feedback on all student responses. Unlike a programmed text, students cannot see the feedback before responding. Students are therefore obliged to subject themselves to all the conditioning designed into the programmed lesson.

Teaching machines usually maintain a record of student performance. This record can be used to analyze progress and serve as a basis for determining future studies. Collectively, a group of student records may be used to determine what curriculum changes are required.

Some feel that the teaching machine provides a constant motivational factor to the student. The student is challenged to "beat the machine." Others claim that this fascination wears off after a time, and once it does, the machine is no more effective than a programmed text (AFM 50-62, 1984, p. 19-5).

Personalized System of Instruction

Keller's Personalized System of Instruction (PSI) was disseminated by his 1968 article, "Goodbye, teacher ...." PSI has been used primarily to replace lecture-based, classroom teaching in higher education. Keller listed five features that distinguish PSI from other instructional systems: (a) the unit mastery requirement, (b) student self-pacing, (c) student proctors, (d) reliance on written instruction, and (e) de-emphasis on lectures.

Like Crowder's intrinsic programming, Keller's PSI uses larger steps than those recommended for Skinner's extrinsic programming. It separates instructional content into content units that are presented in a linear sequence, and it requires students to demonstrate mastery of each unit before proceeding to the next.

Unlike intrinsic programming, PSI leaves most of the individualization up to the individuals. In place of the within-unit instructional items of intrinsic programming, learners receive study guides. Each study guide introduces its unit, lists learning objectives, suggests instructional resources for attaining the objectives, and recommends study questions to help students prepare for the mastery examinations.

PSI takes a hint from peer tutoring in its use of proctors to guide students. The proctors are generally recent graduates of the course and are chosen for their "mastery of the course content and orientation ... maturity of judgement ... understanding of the special problems that confront [beginners] and ... willingness to assist" (Keller, 1968, p. 81). Keller suggests that the use of proctors is the major innovative component of his approach.

Perhaps the most comprehensive review of PSI effectiveness is a meta-analysis documented by Kulik, Kulik, and Cohen (1979a). These researchers reported that the PSI programs studied raised final examination scores by about 0.50 standard deviations over programs using conventional (non-PSI) instruction. They also found that PSI produced less variation in achievement, higher student ratings, and fewer course withdrawals, and that these favorable results occurred across a variety of subject matters and course settings.

Nevertheless, Keller, writing in 1985, was pessimistic about the future of PSI. Problems he cited as most prevalent were the investment of instructor time needed to set up PSI courses and the general lack of support from university administrators. Lloyd and Lloyd (1986) corroborated his concerns. They reported that progressively fewer PSI courses are being taught and many of those depart substantially from the recommended PSI format.

Audio-Tutorial Approach

The audio-tutorial (A-T) approach resembles PSI in that it also modularizes instructional content into units, is mostly applied in higher education, and leaves much of the individualization up to the students. Its basic form was developed in the early 1960s by Samuel Postlethwait and later described by Postlethwait, Novak, and Murray (1972). It consists of (a) individual study sessions using audio tapes and/or other self-study media; (b) weekly group assembly sessions for lectures, films, and major examinations; and (c) small group (6-10 students) quiz sessions. In its early form, the sequence of content units was linear and each unit was intended to encompass about a week's work, limiting individualization of both pace and sequence.

In later forms, A-T evolved into the concept of mini-courses, self-contained modules of varying length that can be presented in a variety of sequences. The mini-courses resemble A-T content units in that students begin with a study guide and a list of learning objectives and then proceed to the usual A-T individual study sessions, group sessions, and small group work. After an established period of time, their knowledge of the unit is assessed by an examination given in a group session.

As with PSI, the most thorough assessment of A-T was performed by Kulik and his associates (Kulik, Kulik, & Cohen, 1979b). In summarizing the results of 42 studies, Kulik et al. reported that A-T increased overall student achievement by about 0.20 standard deviations over conventional means of instruction. This finding held up over a variety of subject matters and higher education settings. Thus, **the overall positive impact of A-T, like programmed instruction, appears to be genuine, but small.**

Individualized Instruction: Computer-Oriented Approaches

Computer-oriented approaches can provide individualization of pace, content, sequence, and style of instruction. These approaches have been reviewed and were found to be effective (Niemiec & Walberg, 1987). Fletcher (1991), however, has suggested that their effectiveness may be significantly increased by including multimedia capabilities.

Computers can be used directly to teach, as in computer-assisted instruction (CAI), and to manage instructional processes, as in computer-managed instruction (CMI). CAI and CMI are often presented as contrasting approaches. However, CMI may include CAI among its prescriptions, to manage student progress; and both may be used to support individualized systems of instruction.

Of the computer-oriented systems discussed here, Individually Prescribed Instruction (IPI), the Adaptive Learning Environments Model (ALEM), and the program for learning in accordance with needs (Project PLAN) use computer resources to help manage instruction. The strands approach, optimized instruction, and intelligent computer-assisted instruction use computers directly to teach.

Individually Prescribed Instruction

Individually prescribed instruction (IPI) was developed in the mid-1960s at the University of Pittsburgh's Learning Research and Development Center as an individualized system of instruction. As with the PSI and A-T approaches, development and use of learning objectives are emphasized and content is modularized into units. Each content unit is preceded by a pre-test, which determines if the unit objectives have already been attained by individual students. Results of the pre-tests are then used to prescribe the instructional content that individuals are to study. A post-test is administered at the end of each content unit. As in PSI, individuals must demonstrate mastery of each unit's learning objectives on the post-test before proceeding.

Adaptive Learning Environments Model

IPI evolved into the adaptive learning environments model (ALEM), which was described by Wang and Walberg (1983). ALEM combines aspects of prescriptive instruction from IPI with independent inquiry and social cooperation from open education. It allows greater adjustment of content than does IPI for individuals with remedial needs by providing tailored learning activities for them. It allows for individualization of pace, content, sequence, and style of instruction.

ALEM includes an organizational structure to help schools implement its essential components. This structure consists of (a) a basic skills curriculum of both highly structured and open-ended activities, (b) an instructional management system that guides use of instructional time and material resources, (c) a family involvement component to integrate school and home learning, (d) a system to devise flexible grouping of students and team teaching, and (e) a staff development component to aid monitoring and implementation of the program. Its central objectives are time related. ALEM is intended to reduce learning time, while increasing the time actually spent on learning and instruction.

Program for Learning in Accordance with Needs

Like IPI and ALEM, the program for learning in accordance with needs (PLAN) used computer resources to manage instruction. It also emphasized the development of learning objectives. It was developed in the late 1960s by the American Institutes for Research, Westinghouse Learning Corporation, and 14 school districts (Flanagan, Shanner, Brudner, & Marker, 1975), but fell into disuse, for a variety of reasons, in the late 1970s.

PLAN included about 6000 learning objectives for language arts, mathematics, and science in Grades 1-12. The instruction was divided into teaching-learning units (TLUs) that were developed for each learning objective. A computer facility was used to collect, store, and process information on student performance and progress.

Like most classroom systems for individualizing instruction, PLAN used diagnostic-prescriptive procedures to determine what instructional content to present. Periodically, a teacher and an individual student would decide on a subset of objectives that the student was to attain next, based on the student's school history and placement test results, which were stored in the computer system. The student was then assigned objectives and given a TLU study guide for each. Each TLU study guide identified instructional resources and activities to be used in attaining its objective. Unlike IPI, these resources were almost always commercial materials that were not specifically developed for this system. PLAN included tests to help teachers assess student progress and a program to train teachers and administrators in its proper use.

Strands Approach

Computer-assisted instruction (CAI) may be divided into four categories:

1. **Drill and practice** – primarily supported by the strands approach; involves the presentation of relatively discrete items to students for the purpose of practice

2. **Tutorial CAI** – generally based on and differs little from Crowderian intrinsic programming (described under the heading Programmed Instruction); resembles programmed instruction

3. **Tutorial simulation** – a computer is used to emulate a device or situation; typically found in training applications of CAI, but increasingly common in educational applications

4. **Tutorial dialogue** – an attempt to directly incorporate the features and benefits of one-on-one, teacher-student interaction in a computer program

Tutorial dialogues, frequently in combination with tutorial simulation, are implemented using intelligent computer-assisted instruction.

The strands approach has been widely used in computer curriculum development since it was conceived at Stanford University in the 1960s.

The term "strand" identifies a basic component skill of the instructional content. For instance, letter identification is a strand in beginning reading instruction and single column addition is a strand in beginning arithmetic instruction. Progress within strands is criterion dependent. Students proceed to a new exercise or new instructional content within a strand only after they attain some performance criterion in the current exercise, thereby providing a running assessment of their progress that can be examined by teachers and system administrators at any time. Students usually work in several strands during a single session, and branching between these strands is time dependent. Students move from one strand to take up where they left off in another strand after an individually specified amount of time. Initial entry into a strand depends on progress in other strands. The strands approach allows for individualization of pace, content, sequence, and style of instruction.

No overall review of the effectiveness of the strands approach was found in the literature, but assessments of individual CBI programs using it have reported favorable results. Suppes, Fletcher, and Zanotti (1976) showed that time spent in strands mathematics could predict instructional progress to the nearest tenth of a grade placement in standardized tests. Ragosta et al. (1982) reported an average improvement of 0.26 standard deviations in achievement for strands applications in mathematics over less-individualized instruction approaches.

Intelligent Computer-Assisted Instruction

The development of individualized programs of instruction that apply computer-based representations of knowledge to the problems of instruction has been directly supported by the emergence of cognitive science. These approaches provide powerful means for individualizing pace, content, sequence, and style of instruction.

Intelligent computer-assisted instruction (ICAI) may be as unintelligently designed as any other approach to instruction. "Intelligence", in this case, suggests an attempt to apply knowledge-based or information-structure-oriented (ISO) approaches to the processes of instruction. Carbonell (1970) contrasted these ISO approaches with ad hoc frame-oriented (AFO) approaches based on programmed instruction techniques such as intrinsic programming.

AFO approaches depend on preprogrammed blocks of static material usually called frames. These frames consist of instructional material followed by questions. Associated with the questions are prespecified correct and incorrect answers that are matched with students' responses. Students have no opportunities to ask questions unless they match the prespecified query options provided by the system developers.

The ISO approach is based on a knowledge representation of the subject matter. A separate tutorial program operates on the knowledge representation, in order to generate instructional material, including questions and the answers to them, and responds to inquiries initiated by students. Discussions concerning the subject matter can be initiated either by the computer program or by the student. This capability for mixed initiative is characteristic of all intelligent computer-assisted instruction. This approach depends on the generation of material from the knowledge base rather than on preprogrammed material and pre-stored, anticipated student responses. To accomplish its objectives, an ICAI program must include three capabilities. It must represent

1. The relevant knowledge domain, including both a subject matter expert's understanding and that expert's ability to explain it to learners (Brown, Burton, & deKleer, 1982).

2. The student's state of knowledge, or model, of the subject matter, providing both diagnostic support for instruction and a representation of the student's misconceptions (Clancey, 1986).

3. An expert tutor, providing the means to sustain the student from one state of knowledge to another (Halff, 1988).

Wenger (1987) provided a comprehensive overview of ICAI systems and Psotka, Massey, and Mutter (1988) described many specific implementations of ICAI. Despite the number of years ICAI systems have been in development, information on their use in instructional settings is only beginning to emerge, and few conclusions can currently be drawn about their effectiveness.

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PROGRAMMED INSTRUCTION

The three methods of programmed instruction in common use are (a) linear, (b) adjunct, and (c) branching. This handout was prepared to familiarize you with the major characteristics of each type.

Linear Programming

To use this linear program, first cover the right-hand column with a piece of paper. Read step 1 and write your answer on the blank line(s) provided. Then slide the cover-paper down the right-hand column just far enough to read the correct answer for step 1. If your answer is correct, go to the next step and follow the same procedure.

If your answer to any step is different from the one in the right-hand column, reread the step and correct your answer. Then go to the next step.

1.	The subject matter in a programmed text using the linear technique is presented in small steps. Learning is easier when you study new material in __________ __________.	small steps
2.	Each small step is designed to help you make the correct response. Blank spaces are provided for your ____________________.	responses or answers
3.	When learning a new subject, trainees often make many errors. If a linear program is carefully prepared, you should make (many/few) errors. __________	few
4.	Your answers are called "constructed responses" because you write them out. Your response to each __________ __________ in a linear program is called a ____________ ____________.	small step constructed response
5.	You only respond to material that is to be learned. When you write out a response, it is called a ______________ ______________.	constructed response
6.	So far you have learned two characteristics of a linear program. A linear program is written in __________ __________ and the method of responding is called __________ __________.	small steps constructed response

7.	Coaching techniques, called prompts or cues, are sometimes used to increase the probability of a correct response. A word that is underlined is a prompt or cue. Underlining of the two words in the statement above gives assistance, so you can respond to the words p__________ or c__________.	prompts cues
8.	Gradually the prompts and cues are withdrawn, in successive steps, as you become more self-reliant and master the subject matter. After a response has been learned, the prompts or cues are __________.	withdrawn
9.	A third characteristic of a linear program is "knowledge of results." In a linear program, acceptable answers are written in the right-hand column of the text. Each time you make a response you are given immediate __________ __________ __________.	knowledge of results
10.	An answer remains concealed from view until a response is made. Then the answer is revealed and your response is reinforced by giving you immediate __________ __________ __________.	knowledge of results
11.	When difficult subject matter is broken down into small parts so that you can easily go from one step to the next, you are using the characteristic of __________ __________.	small steps
12.	When the program from which you are learning demands an answer to be written out, you are using the characteristic of __________ __________.	constructed response
13.	Immediate confirmation of a right or wrong answer describes the characteristic called __________ __________ __________.	knowledge of results
14.	Remember the three characteristics of a linear program. It is written in __________ __________, the method of responding is called __________ __________, and being immediately informed of a correct or incorrect answer is called __________ __________ __________.	small steps constructed response knowledge of results

You have just completed a linear program which familiarized you with three characteristics of linear programming.

Other methods of programming use the same characteristics. However, their style of presentation and format are quite different.

The next method of programming to be covered is "Adjunct." You will easily see how the format of an adjunct program differs from that of a linear one.

We will use the adjunct method to familiarize you with the characteristics of an adjunct program.

Adjunct Programming

Read the following excerpt from a training manual pertaining to Adjunct Programming. After familiarizing yourself with the information, answer the questions on this page. (The correct answers appear at the top of the next page.)

> *Adjunct programming, in its simplest form, consists of a series of questions prepared as an adjunct to existing print-based (hard copy) materials, such as textbooks or training manuals. The questions are designed to elicit the type of responses called for in the learning objectives. For example, if the objectives call for trainees to discriminate between electronic components, questions may require them to select correct components from many alternatives. If the learning objectives state that trainees must be able to perform a task, questions may ask them to show how they would use the objects or processes involved. However, ability is measured by performance and, when possible, the questions require answers that actually demonstrate the attainment of learning objectives.*

_____ 1. True or False: Adjunct programming uses existing hard copy materials.

_____ 2. When you are directed to read a portion of a training manual and answer questions, this is a characteristic of what programming method? (Linear or Adjunct)

_____ 3. Write the letter (A-D) of the phrase which best completes the following statement: An adjunct program

A. consists of a series of small steps to elicit the type response called for in a learning objective.

B. uses existing hard copy materials and questions to elicit the type response called for in a learning objective.

C. is bulky and therefore not very practical for trainee use.

D. requires trainees to respond frequently as they read the material.

4. Write, in your own words, the characteristics of an adjunct program.

____

____

____

ANSWERS

1. True
2. Adjunct
3. B
4. Uses existing hard copy materials and questions to elicit the type response called for in a learning objective.

Branching Programming

Another method of programming is called "Branching." You will be introduced to its style of presentation and format by using a short example of a branching program.

Each of the following steps represents a page from a branching program.

Begin here with Page 1. (Follow instructions carefully.)

Page 1

A branching program differs from a linear or adjunct program in several ways. Nevertheless, the trainee is still required to respond to new material. The major difference in a branching program is that a response to a question directs the trainee to alternate sequences or branches of material. This allows the trainee to make mistakes, and gives remedial information when a wrong answer is chosen.

Choose the correct statement from below and turn to the page indicated.

A. A correct response would direct a trainee to the next logical item of information, thereby omitting remedial information.

TURN TO PAGE 3

B. A branching program forces the trainee to make mistakes.

TURN TO PAGE 2

(From Page 1) **Page 2**

Your answer: **B.** A branching program forces the trainee to make mistakes.

This is not entirely true. A branching program makes allowances for individual differences in experience and learning, and provides necessary remedial information, but it generally does not force a trainee to make mistakes.

Return to Page 1; re-read the information and select the correct statement.

(From Page 1) **Page 3**

Your answer: **A.** A correct response would direct a trainee to the next logical item of information, thereby omitting remedial information.

You are correct. Trainees with a good background of the information being presented would not require any additional instruction. They continue through the program in a straight path, coming in contact only with "right-answer pages." Here the answer is confirmed and new material is presented. When trainees select a wrong answer, they are directed to a wrong-answer page.

Which of the following statements is correct?

A. A wrong-answer page gives remedial instruction.
TURN TO PAGE 5

B. A branching program requires all trainees to follow one path.
TURN TO PAGE 4

(From Page 3) **Page 4**

Your answer: **B.** A branching program requires all trainees to follow one path.

You have chosen a wrong answer. It is possible for some trainees, but not all of them, to proceed through a branching program in a single path. Those that choose wrong answers are given additional instruction on wrong-answer pages.

A wrong-answer page gives remedial instruction.

TURN TO PAGE 5 and read the correct answer.

(From Page 3 or 4) **Page 5**

You have arrived at this page for one or two reasons. You came here either straight from Page 3 or after proceeding through the remedial instruction on Page 4.

Correct answer: **A.** A wrong-answer page gives remedial instruction.

A wrong-answer page supplies a trainee with more background knowledge on a subject, or explains the original item in a different way. The wrong-answer page may also clarify some misconceptions that the trainee might be having. When a mistake has been clarified, the trainee is sent back to the original question and asked to make another selection or sent on to a new page of information.

This concludes the sequence on the characteristics of a branching program.

(Turn to the next page.)

If you went through the sequence of steps without reading the wrong-answer pages, 2 and 4, you got through without making a mistake. If you selected an incorrect response, you were branched to a wrong-answer page and given additional instruction. This illustrates how a branching program is designed.

Answer the following questions. (The correct answers appear at the top of the next page.)

1. The characteristics of a branching program that distinguish it from a linear or adjunct program are: (circle the letter which precedes the best answer.)

    A. A branching program is not adaptable to trainees with individual differences.

    B. The linear and adjunct programming methods are similar to that of branching.

    C. The wrong-answer pages give remedial information.

    D. Pages in a branching program are usually written in textbook style.

2. List the major characteristics of a branching program.

    ____

    ____

    ____

    ____

ANSWERS

1. C
2. - The response to a question directs you to a right-answer or wrong-answer page.
   - Wrong answer pages give remedial information.
   - Right-answer pages confirm the correct answer and present new material.

The end.

Human Resource Development Department

The University of Tennessee
Information Sheet

RESEARCH ON PREPARING SELF-INSTRUCTIONAL MATERIALS

Charles W. Howard examined (a) the effects of five strategies for preparing self-instructional materials, and (b) whether existing instructional materials could be adapted into self-instructional materials which promote learning. The primary purpose of Howard's study was to determine the **efficiency** of five different strategies for preparing self-instructional materials. **Efficiency was investigated in terms of achievement and time**.

The five strategies for preparing self-instructional materials were:

1. **Instructional text**
2. Instructional text **supplemented by post-text questions**
3. Instructional text supplemented by post-text questions, **along with knowledge of results of the post-text questions**
4. Instructional text supplemented by post-text questions, along with knowledge of results of the post-text questions, **and directions for remedial instruction**
5. **Programmed instruction**, developed using content identical to that of the instructional text, and containing linear and branching programming

Methodology

The population from which the research sample was drawn consisted of U.S. Army enlisted and commissioned engineering personnel. The sample consisted of 720 subjects who were assigned to various technical training programs. Subjects were randomly assigned to one of six groups, i.e., five treatment groups and one control group. This random assignment yielded 120 subjects per group.

Pre-test scores were used to determine each subject's level of mastery. Each was classified as a non-master and therefore admissible as a subject for this study.

The primary component was the instructional text content (item 1 on the previous list), which identified and described the functions of parts for a low-voltage circuit tester. The second component consisted of post-text questions derived from the content. The questions were designed to facilitate learning for knowledge and comprehension of the content. Knowledge of results (KR), the third component, consisted of subject matter experts' responses to the post-text questions. For purposes of the study, distinctions between the strategies were made by providing KR to the learners in three of the five strategies. The fourth and last component, remediation, consisted of a written statement directing learners to appropriate portions of the content when their actual performance was not the same as the model performance.

The administration of each of the five strategies followed a common procedure.

1. Instructional Text: Subject was given a manual that contained the content, with no programming.

2. Text/Questions: Subject was given a manual that contained the content material plus a set of questions which were at the end of the material. The directions instructed the learner to overtly respond to the questions.

3. Text/Questions/Knowledge of Results: Subject was given a manual and a set of questions as in item two, except correct responses for the questions were included, in addition to the text/questions.

4. Text/Questions/Knowledge of Results/Remediation: Subject was given a manual containing the content, questions, knowledge of results, and directions to portions of the text to review non-mastered content.

5. Programmed Instruction: Subject was given programmed (self-instructional) materials.

6. Control: Subject was pre-tested and post-tested with no instructional treatment.

The pre-test and post-test consisted of 27 matching items. The format was to provide each subject with a list of statements and a graphic representation of the low-voltage circuit tester. The graphic included the parts of the circuit tester pictured with numerics. The objective was to match the statement with the numeric in the graphic.

The transfer test, consisting of 21 completion items, was designed to measure the transfer of knowledge and skills presented in the materials to their application. A graphic workbook was substituted for the actual equipment. The format was to provide each subject with a written statement of the conditions and standards and a graphic representation of the equipment. The subject was then required to indicate the (a) appropriate hook-up, (b) range of readings, and (c) trouble-shooting procedure.

Results

The dependent variables post-test time, total package time, and total teaching time were analyzed by an analysis of variance model (ANOVA). The results indicated that the **instructional text plus question group was not significantly higher than the programmed instruction group in post-test time, total package time, or total teaching time**. Therefore, a strategy was identified for preparing self-instructional materials that **is as efficient as programmed instruction**.

Evaluation of the effectiveness of the strategies was measured in terms of performance. The dependent variables pre-test and post-test performance scores were analyzed. The results indicated that the **instructional text plus question group was not significantly different than the programmed instruction group**. Thus, a strategy was identified for preparing self-instructional materials that **is as effective as programmed instruction**.

The dependent variable transfer test score was analyzed. The results indicated that **transfer of skills and knowledge occurred as well as in programmed instruction with three other strategies: (a) text plus questions; (b) text, questions, plus feedback; and (c) text only**.

Findings suggest that there is a strategy for preparing self-instructional materials that is as effective and efficient as programmed instruction. Programmed instruction, which results from a rigorous application of instructional systems development procedures, is extremely time-consuming and therefore expensive.

Conclusions

This research examined (a) the transfer of cognitive skills; (b) the effects of KR, remediation, and post-text questions; and (c) informational feedback. The investigation focused on the effectiveness of five strategies for preparing self-instructional materials and the utility of informational feedback.

The results **support post-text questioning. Instructional text or written material followed by post-text questioning resulted in performance as effective as programmed instruction**. Post-text questions are therefore regarded as aids which promote learning.

Although it seems unusual, the research found that two treatments — text plus questions plus feedback, and text plus questions plus feedback plus remediation — when uncontrolled, were less effective than programmed instruction or the use of text plus post-text questions (with no feedback or remediation).

Informational feedback was provided to 50% of the subjects in each of the six groups. Informational **feedback in the form of KR was not found to significantly affect the performance of subjects on the transfer test**.

In summary, the results support the following conclusions:

1. **The use of post-text questions in the form of instructional text plus post-text questions was demonstrated to be the most effective alternative strategy.**
2. Informational feedback in the form of post-text KR was not found to significantly affect the performance of subjects on the transfer test.
3. Knowledge of results plus remediation, when uncontrolled, was less effective than the use of post-text questions only.

Implications and Recommendations

An important implication of this study is that **post-text questions create a learning situation that is both meaningful to the learner and desirable to the instructor and the institution. Use of post-text questions requiring overt response without any form of feedback produced the most desirable results in terms of both time and performance for the alternative strategies.**

This implication has major impact for instructional materials developers. Arguments against it would generally indicate that treatment groups receiving instructional text plus questions plus feedback would presumably obtain higher scores. However, as demonstrated within this study, this was not the case. Therefore, **instructional materials for which treatment groups do not have access to the correct answers, but are permitted to review the instructional materials, are both effective and efficient**. Additionally, existing instructional materials can be adapted into self-instructional materials which promote learning by adding post-text questions.

Reference

Howard, C. W. (1978). *Transfer, Informational Feedback, and Instructional Systems Development*. (ERIC Document Reproduction Service No. ED 156 154)

Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Progress test No. 10

TRAINING COSTS & BENEFITS

Directions: Each of the following items contains four (4) alternatives, one of which provides the **best answer**. Circle the letter which precedes the best answer.

NOTES

1. Financial benefits are typically easiest to measure in programs to train

   A. first-line supervisors.
   B. production skills.
   C. instructors.
   D. management practices.

2. A recommended procedure for achieving cost-effective training is to

   A. determine the absolute minimum training needs and deliver low-cost programs to meet these.
   B. always use the lowest-cost training method available.
   C. design and estimate costs for an optimum program and compare alternatives with this.
   D. concentrate on training costs since benefits cannot be measured in financial terms.

3. The package presented by the training department to support its operating and capital budgets usually should include

   A. training needs, programs, costs, and benefits.
   B. information on scheduling and participant costs.
   C. no mention of objectives other than financial ones.
   D. substantial excess costs to allow for cutting.

4. What is the advantage of charging the costs of a training program back to the using department or organization?

   A. The training department gains control of some of the operating department's funds.
   B. It automatically establishes the financial benefits of the training program.
   C. It substantially reduces the total cost of training to the overall organization.
   D. It reduces the training department budget by transferring some costs to the users.

DETERMINING THE COST EFFECTIVENESS OF TRAINING

Learning Objectives

Upon successful completion of this module, you will be able to:

1. Determine when to measure and report the cost effectiveness of training
2. Calculate the costs of training
3. Describe four levels of measuring training effectiveness
4. Select the outcomes (benefits) to be measured and link training to those outcomes
5. Compute how much training returns relative to its cost (return on investment)
6. Justify training investments based on the cost-benefit ratio
7. Compute the value added by training, using the bottom-line evaluation method
8. Apply the payback period method to determine how long it will take for training to pay for itself
9. Describe the advantages and disadvantages of four different methods of determining cost effectiveness
10. Apply four methods to determine if a training program is cost effective

Rationale (purposes)

1. To discuss the need for justifying training expenditures with documented benefits
2. To provide details on (a) calculating training costs, (b) measuring the effectiveness of training, and (c) methods used in determining the cost effectiveness of training. These methods provide quantitative evidence that effective training is a worthwhile investment rather than a cost.

While this module focuses on the cost effectiveness of training by private sector organizations, the content is also applicable to training provided by public (government) employers.

Introduction

Due to intense competition in an era of rapid economic and technological change, employers are closely scrutinizing their spending on workforce training. Increasingly, training departments and human resource professionals are being asked to justify whether training is a worthwhile investment. Training managers would prefer to measure the effectiveness of their courses and programs with data from criterion-referenced tests and feedback questionnaires. However, higher management requires that training be further justified in terms that are important to them (financial).

Organization of the module. This module is organized in three parts. The first part points out why some training managers are reluctant to determine the cost effectiveness of training. It discusses the need to justify training expenditures with documented benefits. Part 1 also provides practical details and examples of how to calculate the direct, indirect, and full costs of training. A progress check is provided to facilitate your understanding of the content covered and to promote learning.

Part 2 describes four levels of measurement used to determine the effectiveness of training. In addition, the need for a cause-and-effect link between a specific organizational problem and a performance deficiency is addressed. This second part of the module also discusses the selection of outcomes (benefits) to be baselined before training and tracked after training in order to determine the payback. Like Part 1, there is a progress check to facilitate review of the content covered in order to promote learning.

Part 3 of the module presents four methods for determining the cost effectiveness of training courses and programs. The methods described are:

1. Return on investment (ROI)
2. Cost-benefit ratio
3. Bottom-line evaluation
4. Payback period

In addition to providing details and examples for each of these methods, their advantages and disadvantages are identified and listed in a table. Furthermore, a progress check is provided for each method. These progress checks will help you determine how well you understand each method.

At the end of the module is a practical example to facilitate a skill check on your understanding and attainment of the learning objectives listed on page 1.

A note on terminology. In order to enhance understanding, some definitions of the terminology used in this module require clarification.

- **Bottom-line evaluation**. This method shows the value added to each trainee's job performance and the total value added to an organization from training.
- **Cost-benefit ratio**. The ratio of projected costs of training to its estimated benefits. It is a useful method for justifying training investments when the benefits attributable to training are difficult to quantify in monetary units.
- **Cost effectiveness**. The results attained against the costs of time, effort, money, and inconvenience. Cost effectiveness also suggests assigning quantitative values to performance improvements. The criteria for effectiveness are value, worth, and merit.
- **Payback period**. A method for initial consideration of a questionable training investment. It answers the question, "How long will it take the training to pay for itself?".
- **Return on investment (ROI)**. The rate of what something returns relative to its cost. It is a calculative approach to evaluating a result against the amount of resources invested.

Part 1 — Training Costs

When to Measure Cost Effectiveness

Employers have traditionally supported training because (a) it shows the organization's concern for its employees, and (b) higher management "assumes" that the benefits exceed the costs. In any event, when higher management "believes" that training is operationally critical to the organization's competitive position, there may be little or no demand for cost-effectiveness information.

Therefore, despite the increasing admonishment found in training literature about the importance of demonstrating that training is a worthwhile investment, many training managers routinely avoid the use of economic justification. However, when a belief in the value, worth, and merit of training is not part of an underlying business philosophy, reporting the cost effectiveness of training can help the training manager establish credibility and may enhance the organization's willingness to invest additional resources.

The single greatest incentive for indicating the cost effectiveness of training is its use in **justifying training expenditures with documented benefits**. Uncertainty about continued support for the training function leads to the consideration of cost-effectiveness information as a defensive measure — a way of showing higher management that training is not a luxury. Consequently, a growing number of training managers have a desire to **show a return on training investments similar to that on other business investments**. Nevertheless, many lack the knowledge necessary to determine the costs and benefits of training courses and programs (Lombardo, 1989).

When asked to report on a training investment, training managers often hesitate to calculate the costs necessary to develop, deliver, and evaluate training, and are reluctant to document and report the benefits such as increased quality, productivity, sales, and so forth. Among the reasons cited for this reluctance are the

1. Lack of reliable cost figures
2. Difficulty in identifying, monitoring, and quantifying training benefits
3. Subjective nature of the assumptions to be made

4. Inability to isolate training's influence on performance improvements from other factors

5. Time and effort involved in calculating the costs and documenting the benefits of training

6. Potential for unfavorable returns on the investment

Notwithstanding these and other reasons, training managers who feel the need to justify training with evidence that the benefits exceed costs will welcome the opportunity to determine the cost effectiveness of training using the methods presented in this module. These methods can provide quantitative evidence that effective training is a worthwhile investment rather than a cost. Once in place, the methods become easier to use each time they are applied.

Calculating the Costs of Training

Costs are incurred in developing, conducting (delivering), and evaluating training. These **costs are categorized as direct and indirect**. The **full cost of training** is the sum of all direct and indirect costs.

Often, the training manager will not have access to many of the direct and indirect costs of training and must obtain figures or reliable estimates from the organization's payroll, budget, accounting, or comptroller's office. Usually, however, all costs can be accounted for.

Direct costs. Direct costs are expenses tied specifically to a product (training course or program) (Usry, Hammer, & Matz, 1988, p. 26). **Direct personnel costs** include the wages and benefits paid to or on behalf of employees involved in training (e.g., trainees and instructors) as well as fees paid for professional services purchased from external providers (contractors, consultants, etc.). Also included in direct costs are training development and instructional materials preparation (including production) costs, or the review of materials purchased from a vendor. Other direct costs are materials and supplies, equipment, facilities, and travel and per diem.

Organizations generally pay all employee/trainee costs. Training is typically conducted during working hours; consequently, trainees are not available to perform their regular jobs. As a result, every hour which the trainee spends in training costs the organization the equivalent of an hour's wages and benefits for that employee (Deming, 1982).

In calculating personnel costs, **wages and benefits need to be taken as a total compensation package**. All employer-paid benefits, such as insurance, pensions, time paid but not worked (vacation, holidays, sick leave, etc.), and other contributions are included. In the United States, these employer-paid "fringe" benefits average 35% of direct salary costs (Carnevale & Schulz, 1990). A calculation of total daily compensation package costs is shown below.

EXAMPLE OF A TOTAL COMPENSATION PACKAGE

The hourly wage for a welder is $17. In addition, the fringe benefits package costs the employer an additional 30%. The employer's cost for a welder's total daily (8-hour) compensation package is

$17	x	8 hours	+	30 %	x	($17 x 8)	=	$176.80
Hourly wage		Hours per day		Fringe benefits percent		Daily wage		Total daily compensation package

[. . . Daily wage . . .]

Additionally, employees' time is worth more than their total compensation package because they are expected to contribute to the organization's profitability. Consequently, there can be a cost of disruption to productivity or a loss of productivity during training time. This cost becomes more apparent as the number of employees away from their job and the length of training increases. Nevertheless, the total compensation package is the generally accepted means for calculating trainee costs.

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EXAMPLE OF TRAINEE COSTS

Ten welders are attending a two-day workshop on welding techniques. Each welder has a total daily compensation package, including fringe benefits, of $176.80. The trainee costs associated with their participation in this workshop are

10	x	2 days	x	$176.80	=	$3,536.00
Number of trainees		Length of training		Total daily compensation package		Trainee costs

Just as trainee costs are calculated as a direct personnel cost, so should instructor costs be. Yet, more may be involved than just the days the instructor commits to delivering training. In addition, preparation time should be added (Deming, 1982).

EXAMPLE OF INSTRUCTOR COSTS

An instructor requires 1 day of preparation time for a two-day workshop. The instructor's total daily compensation package is $200. The instructor costs associated with this workshop are

1	x	(2 days	+	1 day)	x	$200	=	$600
Number of instructors		Length of training		Length of preparation		Total daily compensation package		Instructor costs

If an organization contracts for **external training services**, the costs of developing and delivering the training as well as the cost of preparing/producing instructional materials may be lumped together with all other costs the contractor or consultant charges. However, when the training is developed internally, **training development and instructional materials preparation costs** need to be calculated.

Calculation of training development and instructional materials preparation costs can be made based on the time expended by the

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developer(s) and instructional materials production personnel involved, and on the costs of materials and supplies required in preparing all types of instructional materials, including printed materials, audiovisual media, manipulative aids, etc. A calculation of development and materials preparation costs could look like the following example (Deming, 1982).

EXAMPLE OF TRAINING DEVELOPMENT AND INSTRUCTIONAL MATERIALS PREPARATION COSTS

A developer spends 4 days developing a training workshop and an additional 7 days preparing printed instructional materials. No production personnel are involved. The developer's total daily compensation package is $225. The cost of materials and supplies required in preparing the instructional materials is $250. The training development and instructional materials preparation costs associated with this workshop are

1	x	(4 days	+	7 days)	x	$225	+	$250	=	$2,725
Number of developers		Days for training development		Days for materials preparation		Total daily compensation package		Cost of materials and supplies		Development and preparation costs

Training development and instructional materials preparation costs can be treated differently than trainee and instructor costs insofar as the training will be repeated. For example, if the cost of developing the training and preparing instructional materials was $2,725 and the workshop was conducted 10 times, then the development and preparation cost assigned to any one workshop would be the total cost ($2,725) divided by the number of workshops (10), or $272.50 per workshop (Deming, 1982).

Another way to treat training development and instructional materials preparation costs is to amortize them over the number of trainees. For example, if the development and preparation cost was

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$2,725 and a total of 150 welders were trained in the 10 workshops, then the cost per trainee would be the total cost ($2,725) divided by the number of trainees (150), or about $18.17 per trainee. These simple calculations show that (a) the more times the training is delivered, and (b) the more welders trained, the more economical the investment in training development and instructional materials preparation will be.

Training managers may purchase "off-the-shelf" instructional materials marketed by a vendor. The purchase price of instructional materials such as books, modules, video tapes, etc., as well as consumable supplies, like pencils, paper, binders, and chalk, can be grouped under the heading, **instructional materials costs** (Deming, 1982).

Some instructional materials costs are the result of multiplying a per-trainee cost by the number of trainees. For example, if 10 trainees each receive a purchased $30 book, the cumulative total cost is $30 multiplied by 10 trainees, or $300.

EXAMPLE OF INSTRUCTIONAL MATERIALS COSTS

The instructional materials for a welding workshop include books purchased from a vendor, costing a total of $300, and consumable supplies which cost $75. The instructional materials costs associated with this workshop are

$300	+	$75	=	$375
Purchased instructional materials		Consumable supplies		Instructional materials costs

Training involves **equipment costs** when machines are essential to effective instruction and learning. Under certain conditions, equipment must be rented or purchased and then maintained. In other instances, training can be scheduled to use equipment available in the organization. For example, welder training requires the use of a gas tungsten arc pipe welding machine. The machine's usage for training may, for all practical purposes, be cost-free if the training can be

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scheduled when the machine is idle. More than likely, however, training workshops would be conducted during normal working hours and the existing pipe welding machine could not be diverted from production for training purposes. Consequently, a duplicate machine would have to be rented or purchased, and maintained.

EXAMPLE OF RENTED EQUIPMENT COSTS

The cost of renting a pipe welding machine for a two-day workshop is $150 per day. In addition, maintenance costs for the machine are $10 per day. The equipment costs associated with this workshop are

2 days	x	($150	+	$10)	=	$320
Length of training		Equipment rental per day		Maintenance cost per day		Rental and maintenance costs of equipment

When equipment is purchased specifically for training, its purchase price can be amortized (written off) over the item's useful life, with yearly maintenance costs added, to find the annual cost. The annual cost is then distributed evenly to all training courses and programs in which the item is used. An example of how to calculate the annual cost and cost per workshop for an item of purchased equipment is provided on the following page.

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EXAMPLE OF PURCHASED EQUIPMENT COSTS

A pipe welding machine was purchased exclusively for training. It cost $24,000 and has an estimated useful life of 5 years. The machine has a yearly maintenance cost of $1,800, and it will be used for 10 workshops per year. The annual equipment cost and cost to each workshop for this machine can be calculated as follows.

($24,000	÷	5 years)	+	$1,800	=	$6,600
Purchase price of equipment		Useful life of equipment		Maintenance cost per year		Annual equipment cost

$6,600	÷	10	=	$660
Annual equipment cost		Number of workshops		Equipment cost per workshop

If a workshop uses several pieces of rented or purchased equipment, their costs are added together (Carnevale & Schulz, 1990).

Facilities costs are incurred when a training facility is built, shared, or rented. In cases where a building or special structure is built for training use, the cost can be amortized over its functional life, with yearly maintenance costs added (as in the purchase of equipment).

Whenever training is conducted within a facility that is used for other organizational functions as well, the appropriate fraction of that facility's cost ought to be billed to training (Deming, 1982).

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EXAMPLE OF FACILITIES COSTS (sharing a facility)

Organization facilities which are used 10% of the time for training have a yearly cost, including maintenance and building administration, of $18,000. The annual facilities costs associated with the training use of these facilities are

$18,000	x	10 %	=	$1,800
Yearly cost of facilities, including maintenance and building administration		Percent of time used for training		Annual facilities costs for training

When organization facilities are used only occasionally for training, a daily rate method may be preferable over the percent of use method shown above. To calculate the daily facilities rate, the total annual facilities cost (for all functions) is divided by the number of working days in the year. If the organization in the above example operates 5 days per week, 52 weeks per year (260 days per year), then their daily facilities rate would be $18,000 divided by 260 days, or about $69.23. The daily rate is then multiplied by the number of days the facility is used for training. For example, the facilities cost for a 2-day workshop would be $69.23 multiplied by 2 days, or $138.46. The percent of use method may then be applied to the result, if appropriate.

In those instances when the **rent** for a shop, classroom, seminar room, etc. is not a flat fee, total facilities costs for a given workshop are computed by multiplying the daily rental rate by the number of rental days. For example, the total facilities costs for a 2-day welding workshop held in a vocational training center that charges $200 per day for its welding shop would be $200 multiplied by 2 days, or $400.

For on-site training, **travel and per diem costs** are likely to be of little consequence. But for training away from the workplace, they are serious cost factors.

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EXAMPLE OF TRAVEL AND PER DIEM COSTS

Ten welders traveled to another city for a 2-day workshop. Their employer is paying the $300 airfare and $70 daily per diem to cover meals, lodging, and other living expenses for each trainee. The employer's costs for travel and per diem for the trainees are

$$(\underbrace{10}_{\text{Number of trainees}} \times \underbrace{2 \text{ days}}_{\text{Length of training}} \times \underbrace{\$70}_{\text{Daily per diem rate}}) + (\underbrace{10}_{\text{Number of trainees}} \times \underbrace{\$300}_{\text{Round-trip air fare}}) = \underbrace{\$4,400}_{\text{Travel and per diem costs}}$$

Indirect costs. Indirect costs are expenses which cannot be traced back to a specific training course or program, but which are necessary for an organization to function. Although indirect costs for training are less visible than direct costs, they are substantial.

Examples of indirect costs include interest on organizational debt, building repairs, utilities, organizational supplies and equipment, administrative and staff support salaries, and expenses for legal, payroll, accounting, and other personnel. Organizations often subdivide such costs into **overhead** and **general and administrative (G & A)** expenses (Carnevale & Schulz, 1990). Overhead and G & A expenses are generally obtained from the organization's accounting office because they are arrived at through allocation, sometimes on a judgmental basis.

Full cost of training. The final calculation to obtain the full cost of a training course or program is a simple addition problem. **First, direct costs** tied to a course or program **are summed**, including

1. Total compensation packages for employees involved in training (e.g., trainees and instructors)
2. Fees for external training services (contractors, consultants, etc.)
3. Training development and instructional materials preparation costs

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4. Costs of instructional materials and consumable supplies purchased from a vendor
5. Equipment costs
6. Facilities costs
7. Travel and per diem costs

Second, indirect costs are summed, e.g., overhead and G & A costs. Finally, the totals from the direct and indirect costs are summed to obtain a grand total, the full cost of training.

EXAMPLE OF A FULL COST OF TRAINING CALCULATION

Total direct costs for a 2-day workshop are $10,000. Total indirect costs consist of allocated overhead of $1,560 and allocated G & A expenses of $375. The full cost of training is

$10,000	+	($1,560 + $375)	=	$11,935
Total direct costs		Total indirect costs		Full cost of training

Conclusion. While calculating the full cost of training is a first and critical step in determining cost effectiveness, monitoring costs is also important to planning and controlling the training budget. In addition, by analyzing costs, training managers are better able to evaluate the proportion of the organization's investment in specific training populations (supervisors; production, maintenance, or office workers; etc.), a particular program, course, or topic, and so forth.

This part of the module shows that a training manager can calculate the costs of training, albeit with the help of those who have access to fiscal data. More challenging is the art of collecting evidence of favorable training outcomes, but it too can be done, as the next part of the module shows.

Progress Check -- Part 1 – Training Costs

Directions. Read each of the following items carefully and write in your answer. If you have difficulty with any of the 13 items, go back and review the relevant content before continuing. Use a calculator or another sheet of paper for your calculations. Check your answers against those provided in the Progress Check Feedback at the end of this module.

1. Identify the greatest incentive for indicating the cost effectiveness of training.

   ____

2. Name two categories of training costs.

   (1) ______________________________

   (2) ______________________________

3. Calculate the total daily (8-hour) compensation package for an employee whose hourly wage is $16, and whose fringe benefits package costs his employer an additional 29%.

   Total daily compensation package = ______________

4. Calculate the training costs for 12 trainees, with individual total compensation packages of $195 per day, who attend a 5-day training program.

   Total trainee costs = ______________

5. Calculate the instructor costs for a 5-day workshop with one instructor who requires 2 additional days for preparation. The instructor's direct salary is $180 per day, with a 30% fringe benefits package.

   Total instructor costs = ______________

6. Calculate the training development and instructional materials preparation costs for two developers, with a total daily compensation package cost to the organization of $220 each, who worked 5 days on developing training and 8 days on preparing instructional materials. The cost of supplies used in preparing the instructional materials was $210.

   Total development and preparation costs = ______________

Progress Check (continued)

7. The cost of developing training and preparing printed instructional materials for a 5-day seminar was $6,300.
   A. What will be the cost per seminar if it is offered once each month for one year?
   Cost per seminar = ______________________________
   B. If the seminar is offered only twice, to a total of 30 trainees (15 in each session), what will be the cost per trainee?
   Cost per trainee = ______________________________
8. The employer purchased books and modules for each of 12 trainees, costing a total of $180 per trainee. Paper and pencils, which cost $45 total, were also required. Calculate the total cost of these instructional materials.
   Total instructional materials costs = ____________________
9. Welding Associates rented equipment for a 4-day training program (workshop) they are conducting. The rental cost for the equipment is $300 per day. Maintenance costs associated with the equipment are $20 per day. What will be the equipment costs for this training program?
   Equipment costs = ______________________________
10. Welding Associates is considering purchasing the arc welding machine needed for training. The machine's purchase price is $22,500 and its estimated useful life is 5 years. In addition, yearly maintenance costs for the purchased machine are expected to be $2,100.
    A. What will be the total annual cost of the machine?
    Total annual equipment cost = ____________________
    B. If Welding Associates uses the machine in a training program offered 12 times per year, what will be the equipment cost for each program?
    Equipment cost per training program = ________________

Progress Check (continued)

11. Welding Associates estimated their total facilities costs, including maintenance, for the current year to be $40,000.
    A. If the facilities are used 15% of the time for training, what portion of the facilities costs should be allocated to the training budget?
    Facilities costs (for training) = ______________________
    B. If the facilities are used for training 5 days per week, 48 weeks per year (240 days per year), what is the daily facilities rate for the use of these facilities?
    Daily facilities rate = ______________________________
12. Six welders will travel from their home to another city to attend a 3-day workshop where they will learn to use specialized equipment. Welding Associates agreed to pay each employee's $400 airfare plus $75 per day for other expenses. Calculate the travel and per diem costs incurred by Welding Associates for this 3-day workshop.
    Travel and per diem costs = ____________________________
13. Welding Associates found their total direct costs for a training program to be $17,000. Indirect costs, consisting of allocated overhead and G & A expenses, totalled $2,000. What was Welding Associates' full cost of training?
    Full cost of training = ________________________________

Part 2 – Training Effectiveness

Measuring the Effectiveness of Training

Donald Kirkpatrick organized the measurement of training effectiveness (value, worth, and merit) into four levels. These levels are listed below, from the easiest to measure (level 1) to the most difficult (level 4). In general, the more levels used to measure a training course or program, the more complete is the evidence of its effectiveness.

- Level 1 -- Measurement of trainees' reactions to the training (feedback)
- Level 2 -- Measurement of knowledge and skills acquired
- Level 3 -- Measurement of trainees' use of their new knowledge and skills on the job
- Level 4 -- Measurement of the organization's return on the training investment

Level 1 information is gathered most often with questionnaires handed out at the end of a course or program or sent to trainees a short time later. At level 2, criterion-referenced tests are used to measure the knowledge and skills acquired. Level 3 ascertains if trainees are applying the newly-acquired knowledge and skills back on the job.

Level 4 determines what benefits (increased quality, productivity, sales, etc.) the new knowledge and skills have had on the organization's performance, and their worth in monetary value. At level 4, training managers are asking about the organization's payback (return) on its training investment (Gordon, 1991).

In most cases, it is possible and feasible to link training outcomes to organizational improvements. Doing so does not require absolute isolation of training's benefits from the possible contributions of other variables. Rather, it requires evidence that demonstrates training's valuable role (Carnevale & Schulz, 1990). Consequently, arguments about whether a training manager can absolutely separate training's influence on organizational improvements and isolate the impact are not pertinent.

Indisputable proof is difficult to come by, even when a carefully designed study using experimental and control groups is conducted. However, evidence can be collected to show that training was at least a major contributor to a particular operational savings or increase in revenue. Kirkpatrick adds that evidence is all anybody really wants, anyhow. " . . . Management isn't going to ask, 'Can you prove it?' They'll ask for evidence. And evidence is not all that hard to come by" (Gordon, 1991, p. 23).

The key to collecting evidence of training outcomes is to establish a "causal link" between a specific organizational problem, preferably one to which monetary value can be assigned, and a performance deficiency. This is best done up front, before a training course or program is even developed.

Rejected workpieces in a manufacturing environment provide one example of an organizational problem. How much does the current reject rate cost the organization? Are rejected workpieces the result of a workforce skill deficiency, as opposed to inferior materials or equipment malfunctions? If so, there is a causal link.

After establishing the link between rejected workpieces and a skill deficiency, current reject costs are determined. The accounting office can provide figures for the cost of the materials used in manufacturing the workpiece. When this cost is added to personnel, equipment, and other appropriate manufacturing costs, the total cost of the rejected workpieces can be calculated. If the number of rejected workpieces declines after the workers are trained, the operational saving provides convincing, quantitative evidence that the training provided a return on the investment.

Benefits. By selecting the outcomes (benefits) to be measured and linking training to those outcomes while holding, to the extent possible, other factors constant, level 4 measurement becomes a relatively simple matter. All training managers have to do is track the outcomes for which baseline measures were gathered before the training, and they will know what the payoff is. Among the most important outcomes (benefits) to be documented are (a) increased quality, productivity, sales, service, safety, and workforce flexibility; (b) reduced operational costs, medical insurance and workers' compensation claims; and (c) lower absenteeism. Other outcomes, which are more difficult to document and quantify, include the increased stability of the workforce; improved morale, harmony, job satisfaction, and attitude; a lower requirement for supervision; the formation of selection pools for promotion; supervisory skill development; and improved customer relations.

Conclusion. Once training managers learn how to calculate the cost and measure the effectiveness of training, they can begin to describe the benefits from a financial perspective. **Is the training effort producing benefits that are greater than the costs involved? This, ultimately, is what higher management wants to know.**

A variety of methods are available for determining the cost effectiveness of training. Some are complex and cumbersome to use, while others are more suitable for justifying an investment in a new machine for a manufacturing plant, a new way of doing a job, and so forth. The four methods for justifying a training investment presented in Part 3 of this module were selected because they are (a) practical, (b) relatively easy to use, and (c) generally familiar to higher management. It must be pointed out, however, that all four methods have disadvantages. Consequently, none of them should be regarded as a precision tool. Nevertheless, these methods are based on accepted principles and present organized state-of-the-art procedures for determining the cost effectiveness of training courses and programs.

Progress Check -- Part 2 – Training Effectiveness

Directions. Read each of the following items carefully and write in your answer. If you have difficulty with any of the items, go back and review the relevant content before continuing. Check your answers against those provided in the Progress Check Feedback at the end of this module.

1. Kirkpatrick noted that the effectiveness of training can be measured at four different levels. Briefly describe the levels.
   (1) ______________________________
   (2) ______________________________
   (3) ______________________________
   (4) ______________________________

2. Is it possible and/or feasible to link training outcomes to organizational improvements without the absolute isolation of training's benefits from the possible contributions of other variables?
   _______ Yes, it is both possible and feasible.
   _______ It is possible, but not feasible.
   _______ It is feasible, but not possible.
   _______ No, it is neither possible nor feasible.

3. What is the key to collecting evidence of training outcomes?
   ____

4. Identify the result of selecting the outcomes to be measured and linking training to those outcomes.
   ____

Part 3 – Methods Used to Determine the Cost Effectiveness of Training

Return on Investment (ROI)

ROI is the rate at which training returns what was invested (its cost). It is an indicator of a particular course or program's value, worth, and merit. Of the four methods for determining the cost effectiveness of training presented in this module, the ROI method is probably the most appealing to higher management, since managers are accustomed to thinking in terms of return on investment. However, the ROI method is appropriate only when it is possible to quantify outcomes (benefits) in monetary units (Kearsley, 1982, p. 92).

The following steps must be taken before a ROI report can be prepared:

- Step 1 -- Calculate the direct and indirect costs associated with the training course or program. These costs are then summed to obtain the full cost of training. (See Part 1 of this module for details.)
- Step 2 -- Gather baseline measures for those outcomes to be analyzed in step 3, **before training occurs**. This is the only way to know what changes took place.
- Step 3 -- Analyze the effects of training on the outcomes (benefits), such as increased quality, productivity, sales, service, safety, and workforce flexibility; reduced operational costs, medical insurance and workers' compensation claims; and lower absenteeism; or any other measurable benefit. In order to apply the ROI method, these benefits must be quantified in monetary units.

Once the full cost of training is calculated, and the outcomes have been analyzed, the ROI can be computed. **Training managers should analyze only those outcomes that are accomplished, at least in part, by training.** To create a credible ROI report, training managers must present evidence that is important and believable to higher management.

Two common approaches for expressing the ROI for a training course or program are to consider **operational savings** and **increases in revenue**. For example, the training manager can assess whether an operational cost, such as accidents due to human error, is significantly lower after employees master safety procedures. In this case, the ROI is the rate at which training costs are recovered by a reduction in the number or severity of accidents.

Reductions in accidents positively affect revenue, through lowered health care costs, insurance premiums, and disability claims, and increase productivity through fewer absentee days. Higher management will be impressed with evidence of training's valuable role in achieving both operational savings and increases in revenue. Consequently, they will look more favorably on training as a value-added service instead of just a "nice to have," but dispensable, cost of operation.

To calculate a ROI, total operational savings and increases in revenue resulting from the training are divided by the full cost of training. ROI expressed as a formula is

$$\frac{\text{Operational savings + increases in revenue}}{\text{Full cost of training}} = \text{ROI}$$

Obviously, any training for which the ROI is greater than one (1.0), the break-even point, is worthwhile, because the benefit derived from the training is greater than its cost (we are "getting out" more than we "put in"). However, a ROI of less than 1.0 means that the training investment was greater than the return.

EXAMPLE OF ROI

A safety training program resulted in operational savings through a $35,000 reduction in accident costs/payments the first year. There was also an annual increase in revenue of $5,000 as a result of fewer absentee days. The full cost of training was $25,000. The program's ROI was

$$\frac{\$35,000 + \$5,000}{\$25,000} = 1.60 \text{ (or } 160\% \text{)}$$

This training program was a worthwhile investment. It returned 160% – the original $25,000 training cost plus an additional $15,000 (60%) in the first year. It will no doubt continue to provide a benefit, even without an additional training investment.

Advantages of the ROI method.

- Provides an indicator of the training's value, worth, and merit.
- Easily understood by higher management.
- Management will be impressed with a favorable ROI report and will view training as a value-added service.

Disadvantages of the ROI method.

- It is appropriate only when it is possible to quantify outcomes (benefits) in monetary units.
- Baseline measures must be gathered for outcomes before training occurs.
- Evidence of operational savings and increases in revenue is available only after the training is conducted. Therefore, its application in predicting a favorable return is limited.

Note. The advantages and disadvantages of the ROI method can be easily compared with those of the cost-benefit ratio, bottom-line evaluation, and payback period methods by referring to Table 1 on pages 40 and 41.

Progress Check -- Return on Investment (ROI)

Directions. Read each of the following items carefully and write in your answer. If you have difficulty with any of the items, go back and review the relevant content before continuing. Use a calculator or another sheet of paper for your calculations. Check your answers against those provided in the Progress Check Feedback at the end of this module.

1. A technical training program is saving your organization $20,000 per year and has increased revenue by $26,000 per year. The full cost of training was $40,000.
    - A. What was the ROI of this training investment?

      ROI = ____________________

    - B. Was this a worthwhile investment?

      Yes _______ No _______

      Why or why not?

    - C. Would your opinion change if you could have invested the $40,000 in a savings fund at a guaranteed 17% annual return instead?

      Yes _______ No _______

      Why or why not?

Cost-Benefit Ratio

The cost-benefit analysis (ratio) method is used to determine the ratio of the **projected full cost** of a given course or program to its **predicted benefits**. This method is especially suitable for justifying training investments when the benefits attributable to training are difficult to quantify in monetary units.

The cost-benefit ratio formula is presented below:

$$\frac{\text{Projected full cost of training}}{\text{Predicted training benefits}} = \text{Cost-benefit ratio}$$

If the cost-benefit ratio is less than one (1.0), the training would be worthwhile, because its predicted benefits exceed its projected costs. The smaller the ratio, the stronger the justification for training. If the ratio is greater than 1.0, costs exceed benefits and the training may not be justifiable, except when mandated by law (compliance training).

The benefits of many courses and programs, such as supervisory skill development, are not easy to show or quantify. Benefits such as reduced workforce turnover, as well as improved morale, harmony, job satisfaction, and attitude are hard to quantify in monetary units, yet they should not be overlooked. No matter how difficult it may seem to put a value on employee turnover, for example, an effort must be made to quantify all benefits for this method to work.

Technically precise and entirely objective monetary information simply is not available on the benefits for some "soft-skills" training. However, the following practical procedure provides appropriate figures for benefits that are difficult to quantify.

Before training is developed and delivered, line managers are asked to estimate the annual operational savings they expect to result for their department. These managers also rate their level of confidence, on a 0 to 100% scale, that the training will be responsible for the savings. **Estimated operational savings are then multiplied by the "confidence" percentage to yield a prediction of total cost savings** (benefits) from training.

EXAMPLE OF COST-BENEFIT RATIO

A company is considering supervisory skills training for its foremen. The enhancement of supervisory skills is expected to reduce workforce turnover. Line managers have been asked to estimate the annual operational savings they expect as a result of the reduced turnover and to rate their level of confidence that training will be responsible for the savings. They estimated the operational savings (from the reduced turnover) at \$100,000, with a confidence rating of 50%. The full cost of the potential training program is projected to be \$10,000. The expected cost-benefit ratio of this training investment is

$$\frac{\$10{,}000}{\$100{,}000 \times 50\ \%} = 0.20$$

Because the cost-benefit ratio is less than 1.0, the training program is considered worthwhile.

Although this example is brief, it illustrates the principles and procedures of the cost-benefit ratio method in providing evidence that this soft-skills course is worthwhile.

Advantages of the cost-benefit ratio method.

- Especially suitable in training situations where the benefits are difficult to quantify in monetary units.
- Practical procedure that provides appropriate figures for benefits that are difficult to quantify.
- Shows whether training is worthwhile, before the course or program is developed and delivered.

Disadvantage of the cost-benefit ratio method.

- The procedure used to predict training benefits in monetary units is subjective.

Note. The advantages and disadvantages of the cost-benefit ratio method can be easily compared with those of the ROI, bottom-line evaluation, and payback period methods by referring to Table 1 on pages 40 and 41.

Progress Check -- Cost-Benefit Ratio

Directions. Read each of the following items carefully and write in your answer. If you have difficulty with either item, go back and review the relevant content before continuing. Use a calculator or another sheet of paper for your calculations. Check your answers against those provided in the Progress Check Feedback at the end of this module.

1. Mr. Whiz predicted that a computer technician training program for two of his employees would result in a total cost savings of $9,000 per year in computer repairs and down-time. He rates his level of confidence, that the training will be responsible for this savings, at 80%. The projected full cost of the technician training is $2,000 per person.

    A. Calculate the cost-benefit ratio for this potential training investment.

    Cost-benefit ratio =

    ____

    B. Do you think this training would be a worthwhile investment for Mr. Whiz's company?

    Yes _______ No _______

    Why or why not?

    ____

    ____

Bottom-line Evaluation

The bottom-line evaluation method presented here determines the value added by training to each trainee's productivity, and the total value added to the organization by the training course or program. The total value added to the organization is compared to the full cost of training to determine if the training was a worthwhile investment.

This method incorporates two of Kirkpatrick's four levels of measuring the effectiveness of training. (See Part 2 of this module for a description of all four levels.) It collects both level 4 (measurement of the organization's return on the training investment) and level 1 (measurement of trainees' reactions to the training) data at the same time. A questionnaire is developed to collect level 4 and level 1 data from trainees after they have applied, back on the job, what they learned in the training.

Trainees indicate their individual opinions of (a) percent of job-time spent performing the task trained (T), (b) pre-training productivity percentages (P1), and (c) post-training productivity percentages (P2). Along with questionnaire responses, other information necessary to perform a bottom-line evaluation includes a list of the tasks performed by the trainees and their total annual compensation package (S). The bottom-line evaluation method expressed as a formula is

(S	x	T)	x	(P2 - P1)	=	Value added by training
Total annual compensation package		Percent of job-time spent performing task trained		Percentage change in productivity as a result of training		

[Annual per-task compensation]

The bottom-line evaluation method promotes the use of job analysis information in that tasks performed by the employee/trainee must be identified, along with percent of job-time spent on those tasks, in order to calculate per-task compensation (S x T, in the above formula).

Criticisms of the bottom-line evaluation method include: (a) trainee questionnaire responses are subjective perceptions; and (b) potential for biased questionnaire input. However, the calculated value added can be corrected for bias using statistical methods.

Despite the criticisms, however, this method does promote employee participation in decision making. Employees often feel that they are the best judges of their individual performance improvement following training. The method also appeals to management because it links employees' job task performance with their productivity, by comparing the full cost of the training with the value the organization receives from it.

EXAMPLE OF BOTTOM-LINE EVALUATION

A training program in erecting and dismantling scaffolding was provided to three employees. After the employees returned to their job and applied the knowledge and skill acquired, they were asked to complete a questionnaire. Each employee supplied information on their perceptions of (a) percent of job-time spent performing the task trained, and (b) pre- and post-training productivity percentages. Each employee's total compensation package, percent of job-time spent performing the task trained, and pre- and post-training productivity percentages are presented in the table below, along with their individual and total value added to the organization as a result of the training.

Employee/ trainee	Total annual compensation package ($) [S]	Job-time (%) spent performing the task trained [T]	Component pay ($) [D = SxT]	Pre-training productivity (%) [P1]	Post-training productivity (%) [P2]	Productivity gain (%) [G = P2-P1]	Value added ($) [GxD]
1	$29,000	25%	$7,250	30%	80%	50%	$3,625
2	$30,000	20%	$6,000	40%	90%	50%	$3,000
3	$34,000	15%	$5,100	50%	80%	30%	$1,530
					Total value added		$8,155

The total value added to the organization by the training program was $8,155. If the full cost of training was less than $8,155, then the training program was a worthwhile investment.

Advantages of the bottom-line evaluation method.

- Promotes the use of job analysis information.
- Promotes employee participation in decision-making.
- Appeals to management, because it links job task performance with training and productivity.
- Allows the total value added to the organization to be compared to the full cost of training to determine if the training was a worthwhile investment.

Disadvantages of the bottom-line evaluation method.

- Questionnaire responses are subjective perceptions by trainees.
- Questionnaire data might be biased.

Note. The advantages and disadvantages of the bottom-line evaluation method can be easily compared with those of the ROI, cost-benefit ratio, and payback period methods by consulting Table 1 on pages 40 and 41.

Progress Check -- Bottom-Line Evaluation

Directions. Read each of the following items carefully and write in your answer. If you have difficulty with any of the items, go back and review the relevant content before continuing. Use a calculator or another sheet of paper for your calculations. Check your answers against those provided in the Progress Check Feedback at the end of this module.

1. A training manager has identified all the tasks performed by each employee within the organization, along with their total compensation packages. The training department is providing a welding training program for the welding department's four employees, at a total cost of $4,400. Each welder has a total annual compensation package of $20,000. The training manager would like to present training's value to higher management. The training is delivered and questionnaire results, in table form, are as follows.

Employee/ trainee	Total annual compensation package ($) [S]	Job-time (%) spent performing the task trained [T]	Component pay ($) [D = SxT]	Pre-training productivity (%) [P1]	Post-training productivity (%) [P2]	Productivity gain (%) [G = P2-P1]	Value added ($) [GxD]
1		10%		20%	60%		
2		40%		20%	50%		
3		30%		30%	50%		
4		20%		40%	60%		
Total value added							

A. Complete the table. For each employee, you will need to calculate component pay, productivity gain, and value added. You will also need to calculate the training program's total value added to the organization.

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Progress Check (continued)

B. Was the training program worthwhile?

Yes _______ No _______

Why or why not?

____

____

Payback Period

The fourth method of determining the cost effectiveness of a training investment is called the payback period method. This **forecasting** method answers the question, "How long will it take the training to pay for itself?" **This method should**, however, **be used only as an initial look at a questionable training investment.**

The payback period method does not consider the cost or time value of the money spent and tied up before, during, and after the training until the break-even point is reached. Nevertheless, it does consider some time factors in calculating the payback.

If the payback period is very short, less than one year, for example, then the training course or program is definitely promising and another method, such as ROI, cost-benefit ratio, or bottom-line evaluation, should be used for a closer examination of the training's value, worth, and merit to the organization. If the payback period is very long, 10 years, for example, then there may be no need to consider the training further, depending on the organization's philosophy about the maximum length of time allowed for investment resources to be returned.

The payback period method is represented by the following formula:

$$\frac{\text{Full cost of training}}{\text{Annual operational savings + increase in revenue}} = \text{Payback period (in years)}$$

EXAMPLE OF PAYBACK PERIOD

A company is considering an all-inclusive clerical training program. The full cost of this training is $10,000. Company managers estimate that improved clerical effectiveness resulting from the training will save $1,200 per month ($14,400 per year). Should the company give further consideration to this training?

$$\frac{\$10{,}000}{\$14{,}400} = \quad 0.69 \text{ years (about 8.3 months or 36 weeks)}$$

Yes, the company should consider the training further. Its payback period is very short, less than one year. Further calculation shows that, if the company's savings estimates are accurate, this investment (a) has a worthwhile cost-benefit ratio of only 0.69, and (b) will return 144% in the first year (the training year).

Advantages of the payback period method.

- Provides a quick initial look at a potential training investment.
- Answers the question, "How long will it take the training to pay for itself?"

Disadvantages of the payback period method.

- Should be used only as a screening tool. If the payback period is short, then another method (ROI, cost-benefit ratio, or bottom-line evaluation) must be used to examine the training's value, worth, and merit to the organization.
- Does not consider the cost or time value of the money spent and tied up before, during, and after the training until the break-even point is reached.

Note. The advantages and disadvantages of the payback period method can be easily compared with those of the ROI, cost-benefit ratio, and bottom-line evaluation methods by consulting Table 1 on the following pages.

Table 1

Advantages and Disadvantages of Methods for Determining the Cost Effectiveness of Training

Advantages	Disadvantages
Return on investment (ROI)	
Provides an indicator of training's value, worth, and merit. Easily understood by higher management. Management will be impressed with favorable ROI report and view training as a value-added service.	Appropriate only when it is possible to quantify outcomes (benefits) in monetary units. Baseline measures must be gathered for outcomes before training occurs. Evidence of operational savings and increases in revenue available only after training is conducted. Therefore, ROI's application in predicting a favorable return is limited.
Cost-benefit ratio	
Especially suitable in situations where the benefits are difficult to quantify in monetary units. Practical procedure that provides appropriate figures for benefits that are difficult to quantify. Shows whether training is worthwhile, before course or program is developed and delivered.	Procedure used to predict benefits in monetary units is subjective.

(Table continues)

Table 1. (continued)

Advantages	Disadvantages
Bottom-line evaluation	
Promotes use of job analysis information. Promotes employee participation in decision-making. Appeals to management, because it links job task performance with training and productivity. Total value added to the organization can be compared to full cost of training to determine if training was a worthwhile investment.	Questionnaire responses are subjective perceptions by trainees. Questionnaire data might be biased.
Payback period	
Provides quick initial look at potential training investment. Answers question, "How long will it take training to pay for itself?"	Should be used only as screening tool. If payback period is short, then another method must be used to examine training's value, worth, and merit to organization. Does not consider cost or time value of money spent and tied up before, during, and after training until the break-even point is reached.

Progress Check -- Payback Period

Directions. Read each of the following items carefully and write in your answer. If you have difficulty with either item, go back and review the relevant content before continuing. Use a calculator or another sheet of paper for your calculations. Check your answers against those provided in the Progress Check Feedback at the end of this module.

1. Fixit Company is considering a training workshop for 12 employees. The full cost of the training workshop (for all 12 employees) is $9,000. The training manager has estimated that the additional training would enable the company to increase its revenue by $5,000 per year. He has decided that if the payback period was no more than 2 years, then he would give further consideration to the workshop.
   A. Calculate the payback period for this potential training investment.
      Payback period = ______________________________
   B. Should the training manager consider the training workshop further?
      Yes _______ No _______
      Why or why not?
      ____
      ____

Practical Example Skill Check

Background information. The training manager for the Camel Company had no interest in or idea how to determine the cost effectiveness of training. Consequently, the use of economic justification was avoided, and higher management came to view training as a cost of doing business. During an economic downturn, most of the training staff was cut as a result of "down-sizing." As a result, the training manager decided that he had better learn how to justify training as a worthwhile investment if he wanted to keep his job.

The training manager's first effort was to establish a "causal link" between a specific organizational problem and a performance deficiency. Finally, he had to provide evidence, in monetary units, that training was a worthwhile investment for the company.

Because the general manager of the Camel Company was accustomed to making decisions based on return on investment (ROI) reports, the training manager chose this method to justify the cost effectiveness of training.

Answers to the following items are provided in the Practical Example Skill Check Feedback at the end of this module.

I. List the three steps the training manager must take before preparing a return on investment (ROI) report for the general manager?

(1) ____

____

(2) ____

____

(3) ____

____

Practical Example Skill Check (continued)

II. The following is a list of outcomes that could be measured. To prepare a **credible ROI report**, the evidence presented to the general manager should be described in which of the following terms? Place an X in front of those outcomes (benefits) which would provide convincing evidence that training was a worthwhile investment.

_____ 1. How those trained thought the training program went

_____ 2. Any increase in operational savings attributable to the training

_____ 3. Test scores showing that all trainees passed the post-test (final exam)

_____ 4. How efficient the trainees' supervisors thought the training program was

_____ 5. Increased revenue attributable to enhanced proficiency of the workers after training

_____ 6. Suggestions for improving/deleting parts of the training, derived from the training exit survey

_____ 7. Reduced medical claims attributable to safety awareness from the training program

_____ 8. Company executives' feelings about the training program

_____ 9. Reduced operational costs

Practical Example Skill Check (continued)

III. List the advantages and disadvantages of two other methods that the training manager could use to determine the cost effectiveness of training.

Method	Advantages	Disadvantages

Practical Example Skill Check (continued)

IV. Ten employees in the maintenance department went through a one-week (40-hour) training program. The training costs were as follows:

Cost item	Amount
Workers' total weekly compensation package (10 workers)	$ 8,500
Trainers' total weekly compensation package (2 trainers)	$ 4,200
Training development and instructional materials preparation	$ 1,000
Purchased instructional materials and consumable supplies	$ 450
Equipment rental	$ 1,000
Allocated facilities costs ($70 per day)	$ 350
Overhead and G & A expenses (total)	$ 500
Full cost of training	$16,000

Actual benefits of the program were difficult to quantify. However, the benefit item amounts listed on the next page were found by (a) taking figures for each item from the 12 monthly periods before the training; (b) then obtaining an average of the 12 figures for each item reported; (c) calculating each item's average monthly benefit (the difference between the item average and the figure for the same item after training); and (d) annualizing the resulting monthly benefit (by multiplying by 12).

Practical Example Skill Check (continued)

IV. (continued)

Benefit item	Annualized benefit amount from training
Operational costs (reduced)	$ 9,600
Productivity (increased)	$13,200
Absenteeism (decreased)	$ 3,000
Quality (improved)	$ 2,400
Total annual benefit	$28,200

After applying, back on the job, what they learned in training, the employee/trainees completed a questionnaire. The response data indicated that, on average,

(1) 35% of their job-time was spent performing the task trained

(2) Their productivity in performing the task trained improved 28% as a direct result of the training.

Using the information given (in item IV), and the payback period method, how long before the break-even point for this training was reached? Show all calculations.

Payback period = ______________________________

Practical Example Skill Check (continued)

V. Continuing with the information from item IV, and using the ROI, cost-benefit ratio, and bottom-line evaluation methods, determine if this training should be continued or terminated. Describe your rationale. Use the following criteria: "Any activity in which the organization is involved, including any department within the organization, should add appreciably to our goal of 11.5% increase in total annual revenue over the next five years." (from Camel Company's Vision, Values, and Goals statement.)

ROI = ____

Cost-benefit ratio (using calculated costs and benefits) =

____

Bottom-line evaluation (total value added) =

____

____

Determination:

Continue the training _______

Terminate the training _______

Rationale:

____

____

____

____

____

____

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Progress Check Feedback --

Part 1 — Training Costs (pp. 15-17)

1. Identify the greatest incentive for indicating the cost effectiveness of training.

   Justifying training expenditures with documented benefits (p. 4)

2. Name two categories of training costs.

   (1) *direct costs*

   (2) *indirect costs (p. 5)*

3. Calculate the total daily (8-hour) compensation package for an employee whose hourly wage is $16, and whose fringe benefits package costs his employer an additional 29%.

   Total daily compensation package =

   ($16 x 8 hours) + (29% x $16 x 8 hours) = $165.12

4. Calculate the training costs for 12 trainees, with individual total compensation packages of $195 per day, who attend a 5-day training program.

   Total trainee costs = *12 trainees x 5 days x $195 = $11,700*

5. Calculate the instructor costs for a 5-day workshop with one instructor who requires 2 additional days for preparation. The instructor's direct salary is $180 per day, with a 30% fringe benefits package.

   Total instructor costs =

   1 instructor x (5 + 2 days) x [$180 + ($180 x 30%)] = $1,638

6. Calculate the training development and instructional materials preparation costs for two developers, with a total daily compensation package cost to the organization of $220 each, who worked 5 days on developing training and 8 days on preparing instructional materials. The cost of supplies used in preparing the instructional materials was $210.

   Total development and preparation costs =

   [2 developers x (8 + 5 days) x $220] + $210 = $5,930

Progress Check Feedback -- Part 1 – Training Costs (continued)

7. The cost of developing training and preparing printed instructional materials for a 5-day seminar was $6,300.

   A. What will be the cost per seminar if it is offered once each month for one year?

   Cost per seminar = *$6,300 ÷ 12 times offered = $525*

   B. If the seminar is offered only twice, to a total of 30 trainees (15 in each session), what will be the cost per trainee?

   Cost per trainee = *$6,300 ÷ 30 trainees = $210*

8. The employer purchased books and modules for each of 12 trainees, costing a total of $180 per trainee. Paper and pencils, which cost $45 total, were also required. Calculate the total cost of these instructional materials.

   Total instructional materials costs =
   ($180 x 12 trainees) + $45 = $2,205

9. Welding Associates rented equipment for a 4-day training program they are conducting. The rental cost for the equipment is $300 per day. Maintenance costs associated with the equipment are $20 per day. What will be the equipment costs for this training program?

   Equipment costs = *4 days x ($300 + $20) = $1,280*

10. Welding Associates is considering purchasing the arc welding machine needed for training. The machine's purchase price is $22,500 and its estimated useful life is 5 years. In addition, yearly maintenance costs for the purchased machine are expected to be $2,100.

    A. What will be the total annual cost of the machine?

    Total annual equipment cost =
    ($22,500 ÷ 5 years) + $2,100 = $6,600

    B. If Welding Associates uses the machine in a training program offered 12 times per year, what will be the equipment cost for each program?

    Equipment cost per training program =
    $6,600 annual cost ÷ 12 times offered = $550

Progress Check Feedback -- Part 1 — Training Costs (continued)

11. Welding Associates estimated their total facilities costs, including maintenance, for the current year to be $40,000.

    A. If the facilities are used 15% of the time for training, what portion of the facilities costs should be allocated to the training budget?

    Facilities costs (for training) = *$40,000 x 15% = $6,000*

    B. If the facilities are used for training 5 days per week, 48 weeks per year *[5 days x 48 weeks = 240 days per year]*, what is the daily facilities rate for the use of these facilities?

    Daily facilities rate = *$40,000 ÷ 240 days = $166.67*

12. Six welders will travel from their home to another city to attend a 3-day workshop where they will learn to use specialized equipment. Welding Associates agreed to pay each employee's $400 airfare plus $75 per day for other expenses. Calculate the travel and per diem costs incurred by Welding Associates for this 3-day workshop.

    Travel and per diem costs =

    (6 welders x 3 days x $75) + (6 x $400 air fare) = $3,750

13. Welding Associates found their total direct costs for a training program to be $17,000. Indirect costs, consisting of allocated overhead and G & A expenses, totalled $2,000. What was Welding Associates' full cost of training?

    Full cost of training = *$17,000 + $2,000 = $19,000*

Progress Check Feedback --

Part 2 – Training Effectiveness (p. 21)

1. Kirkpatrick noted that the effectiveness of training can be measured at four different levels. Briefly describe the levels.

   (1) *(See page 18)*

   (2) ____________________

   (3) ____________________

   (4) ____________________

2. Is it possible and/or feasible to link training outcomes to organizational improvements without the absolute isolation of training's benefits from the possible contributions of other variables?

   X Yes, it is both possible and feasible. *(p. 18)*
   _______ It is possible, but not feasible.
   _______ It is feasible, but not possible.
   _______ No, it is neither possible nor feasible.

3. What is the key to collecting evidence of training outcomes?

   Establish a causal link between a specific organizational problem, preferably a problem to which monetary value can be assigned, and a performance deficiency. (p. 19)

4. Identify the result of selecting the outcomes to be measured and linking training to those outcomes.

   Level 4 measurement becomes a relatively simple matter. (p. 19)

Progress Check Feedback --

Return on Investment (ROI) (p. 26)

1. A technical training program is saving your organization $20,000 per year and has increased revenue by $26,000 per year. The full cost of training was $40,000.

   A. What was the ROI of this training investment?

   ROI = *($20,000 + $26,000) ÷ $40,000 = 1.15 or 115%*

   B. Was this a worthwhile investment?

   Yes *X*   No ________

   Why or why not?

   The ROI is greater than one (1.0), the break-even point. The training investment is returning 115% per year. The first year, this is the original training investment plus an additional $6,000 (or 15%). The training will no doubt continue to provide a benefit, even without additional investment.

   C. Would your opinion change if you could have invested the $40,000 in a savings fund at a guaranteed 17% annual return instead?

   Yes ________   No *X*

   Why or why not?

   In the first year, the 17% return on savings would be better than the 15% return from the training investment. However, the training investment will no doubt continue to provide a return without an additional investment.

Progress Check Feedback --

Cost-Benefit Ratio (p. 30)

1. Mr. Whiz predicted that a computer technician training program for two of his employees would result in a total cost savings of $9,000 per year in computer repairs and down-time. He rates his level of confidence, that the training will be responsible for this savings, at 80%. The projected full cost of the technician training is $2,000 per person.

   A. Calculate the cost-benefit ratio for this potential training investment.

   Cost-benefit ratio =

   (2 trainees x $2,000) ÷ ($9,000 x 80%) = 0.556

   B. Do you think this training would be a worthwhile investment for Mr. Whiz's company?

   Yes *X*   No _______

   Why or why not?

   The cost-benefit ratio of this potential training investment is less than one (1.0). (p. 27)

Progress Check Feedback --

Bottom-Line Evaluation (pp. 35-36)

1. A training manager has identified all the tasks performed by each employee within the organization, along with their total compensation packages. The training department is providing a welding training program for the welding department's four employees, at a total cost of $4,400. Each welder has a total annual compensation package of $20,000. The training manager would like to present training's value to higher management. The training is delivered and questionnaire results, in table form, are as follows.

Employee/ trainee	Total annual compensation package ($) [S]	Job-time (%) spent performing the task trained [T]	Component pay ($) [D = SxT]	Pre-training productivity (%) [P1]	Post-training productivity (%) [P2]	Productivity gain (%) [G = P2-P1]	Value added ($) [GxD]
1	*$20,000*	10%	*$2,000*	20%	60%	*40%*	*$ 800*
2	*$20,000*	40%	*$8,000*	20%	50%	*30%*	*$2,400*
3	*$20,000*	30%	*$6,000*	30%	50%	*20%*	*$1,200*
4	*$20,000*	20%	*$4,000*	40%	60%	*20%*	*$ 800*
						Total value added	*$5,200*

A. Complete the table. For each employee, you will need to calculate component pay, productivity gain, and value added. You will also need to calculate the training program's total value added to the organization.

B. Was the training program worthwhile?

Yes *X* No ______

Why or why not?

The value added to the organization by the training ($5,200) was greater than the training investment ($4,400).

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Progress Check Feedback --
Payback Period (p. 42)

1. Fixit Company is considering a training workshop for 12 employees. The full cost of the training workshop (for all 12 employees) is \$9,000. The training manager has estimated that the additional training would enable the company to increase its revenue by \$5,000 per year. He has decided that if the payback period was no more than 2 years, then he would give further consideration to the workshop.

   A. Calculate the payback period for this potential training investment.

   Payback period = *\$9,000 ÷ \$5,000 = 1.8 years*

   B. Should the training manager consider the training workshop further?

   Yes ___*X*___ No _______

   Why or why not?

   The payback period was less than the training manager's cut-off of 2 years.

Practical Example Skill Check Feedback (pp. 43-48)

I. List the three steps the training manager must take before preparing a return on investment (ROI) report for the general manager?

(1) *Calculate the direct and indirect costs associated with the training. Then add these costs to obtain the full cost of training.*

(2) *Baseline (before training) those outcomes to be analyzed in step 3.*

(3) *Analyze the effects of training on the outcomes (benefits) in monetary units. (p. 22)*

II. The following is a list of outcomes that could be measured. To prepare a **credible ROI report**, the evidence presented to the general manager should be described in which of the following terms? Place an X in front of those outcomes (benefits) which would provide convincing evidence that training was a worthwhile investment.

_____ 1. How those trained thought the training program went

X 2. Any increase in operational savings attributable to the training *(pp. 22-23)*

_____ 3. Test scores showing that all trainees passed the final exam

_____ 4. How efficient the trainees' supervisors thought the training program was

X 5. Increased revenue attributable to enhanced proficiency of the workers after training *(pp. 22-23)*

_____ 6. Suggestions for improving/deleting parts of the training, derived from the training exit survey

X 7. Reduced medical claims attributable to safety awareness from the training program *(p. 22)*

_____ 8. Company executives' feelings about the training program

X 9. Reduced operational costs *(pp. 22-23)*

Practical Example Skill Check Feedback (continued)

III. List the advantages and disadvantages of two other methods that the training manager could use to determine the cost effectiveness of training.

Method	Advantages	Disadvantages
(See Table 1, pages 40 and 41)		

Practical Example Skill Check Feedback (continued)

IV. Ten employees in the maintenance department went through a one-week (40-hour) training program. The training costs were as follows:

Cost item	**Amount**
Workers' total weekly compensation package (10 workers)	$ 8,500
Trainers' total weekly compensation package (2 trainers)	$ 4,200
Training development and instructional materials preparation	$ 1,000
Purchased instructional materials and consumable supplies	$ 450
Equipment rental	$ 1,000
Allocated facilities costs ($70 per day)	$ 350
Overhead and G & A expenses (total)	$ 500
Full cost of training	$16,000

Actual benefits of the program were difficult to quantify. However, the benefit item amounts listed on the next page were found by (a) taking figures for each item from the 12 monthly periods before the training; (b) then obtaining an average of the 12 figures for each item reported; (c) calculating each item's average monthly benefit (the difference between the item average and the figure for the same item after training); and (d) annualizing the resulting monthly benefit (by multiplying by 12).

Practical Example Skill Check Feedback (continued)

IV. (continued)

Benefit item	Annualized benefit amount from training
Operational costs (reduced)	$ 9,600
Productivity (increased)	$13,200
Absenteeism (decreased)	$ 3,000
Quality (improved)	$ 2,400
Total annual benefit	$28,200

After applying, back on the job, what they learned in training, the employee/trainees completed a questionnaire. The response data indicated that, on average,

(1) 35% of their job-time was spent performing the task trained

(2) Their productivity in performing the task trained improved 28% as a direct result of the training.

Using the information given (in item IV), and the payback period method, how long before the break-even point for this training was reached? Show all calculations.

Payback period = *$16,000 ÷ $28,200 = 0.57 years (about 6.8 months or 29.5 weeks)*

Practical Example Skill Check Feedback (continued)

V. Continuing with the information from item IV, and using the ROI, cost-benefit ratio, and bottom-line evaluation methods, determine if this training should be continued or terminated. Describe your rationale. Use the following criteria: "Any activity in which the organization is involved, including any department within the organization, should add appreciably to our goal of 11.5% increase in total annual revenue over the next five years." (from Camel Company's *Vision, Values, and Goals* statement.)

ROI = *$28,200 ÷ $16,000 = 1.76 or 176%*

Cost-benefit ratio (using calculated costs and benefits) =
$16,000 ÷ $28,200 = 0.57

Bottom-line evaluation (total value added) =
[($8,500 x 52 weeks) x 35% job-time on task] x 28% improvement = $43,316

Determination:

Continue the training *X*
Terminate the training ______

Rationale:

- *The training returns the investment plus an additional 76% in the first year, far more than the stipulated 11.5% annual return.*
- *The cost-benefit ratio is well below one (1.0).*
- *The value added to the organization by the training is more than 2 times greater than the training investment.*

AN ACCOUNTING FRAMEWORK FOR INVESTMENTS IN HUMAN RESOURCE DEVELOPMENT

Individuals		Governments		Employers	
Costs	Benefits	Costs	Benefits	Costs	Benefits
Compulsory schooling (formal education)[1]					
Taxes, fees, + associated costs	Acquisition of foundation knowledge, skills, & values + personal and social development	Subsidy, grants, sale of natural resources, licenses & permits, gambling	Social coherence, individuals with social skills & a foundation for living in a complex culture	Taxes, donations	Social coherence, literacy, foundation skills + indirect relationship to employment
Higher education (formal education)[1]					
Taxes, tuition, fees, books, & other related costs + foregone earnings	Acquisition of knowledge, skills, & employability qualifications, leading to a profession + enhanced social & economic well-being	Subsidy, grants, scholarships, loans	Enhanced social coherence; foundation for lifelong learning; an articulate, flexible, skilled, and able population, that contributes to their workplace and community; economic growth with increased tax returns	Taxes, donations, endowments, gifts, scholarships	Improved knowledge & skills of potential workers which contribute to goals such as increased productivity, profitability, etc.

Individuals		Governments		Employers	
Costs	Benefits	Costs	Benefits	Costs	Benefits
Public post-compulsory education/training (formal education)[1]					
Taxes, tuition, fees, books, & other related costs + foregone earnings	Acquisition of knowledge, skills, practical experience, & employability qualifications leading to a job or higher earnings + better quality of life	Subsidy, grants, scholarships, loans, sale of trainee practice products, produce, & services	Enhanced social coherence, foundation for lifelong learning, employment capabilities, economic growth with increased tax returns	Taxes, donations, gifts	Specific knowledge, skills, attitudes, and qualifications which address goals such as increased productivity, better quality, etc.
Employer training (nonformal training)[2]					
None	Acquisition of knowledge, skills, + enhanced employability & job security	None (private funds) to a full subsidy (public funds)	Self-supporting contributor to society, economic growth with increased tax returns	All (private funds) to none (public funds)	Workplace-specific knowledge, skills, and attitudes which address goals such as increased productivity, better quality, etc.
Informal learning[3]					
Direct costs, if any	Acquisition of knowledge, skills, & qualifications leading to a better life	None (private funds) to a full subsidy (public funds)	Enhanced social cohesion + advanced knowledge & skills	None	Improved knowledge & skills of workforce

[1] **Formal education** is a system with a hierarchic structure and chronological succession of grades, from kindergarten through the university which, in addition to academic studies, comprises a variety of specialized programs and full-time training institutions. Classes are conducted within specially built schools, centers, institutes, or colleges. Strictly controlled credentials form the basis of legitimacy.

[2] **Nonformal training** is organized and conducted outside the formal education system for employees to attain particular learning objectives. Examples include on-the-job, vestibule, and apprenticeship training.

[3] **Informal learning** requires a conscious effort throughout life to take advantage of available opportunities to learn through the environment, for example, the library, open learning centers, and communication media (magazines, television, computers, etc.).

Human Resource Development Department 501
Survey of Human Resource Development

The University of Tennessee
Progress test No. 11

LEGAL ASPECTS OF TRAINING

Directions: Each of the following items contains four (4) alternatives, one of which provides the **best answer**. Circle the letter which precedes the best answer.

NOTES

1. It is important to determine whether training time is compensable under federal legislation because

   A. training cannot be conducted during regular work hours.
   B. all participants in training would have to be paid overtime.
   C. participants in some training programs would have to be paid overtime.
   D. salaried employees taking part in training would have to be paid overtime.

2. Under federal wage and hour laws,

   A. all trainees and apprentices are exempt from minimum wage requirements.
   B. trainees and apprentices can never be paid subminimal rates.
   C. trainees and apprentices may be paid subminimal rates, under certain defined circumstances.
   D. trainees and apprentices are considered the same as employees who take college courses at night.

3. Which of the following would most likely qualify as true apprenticeship training eligible for U.S. government guidance and assistance?

   A. A one-year work/study program to train clerk-typists.
   B. An on-the-job sales training program with no classroom instruction.
   C. A work experience training program for 14- to 16-year-old migrants to learn harvesting techniques.
   D. A 5-year program combining classroom instruction and on-the-job experience to train electricians.

Human Resource Development Department
Training for Human Resource Development

The University of Tennessee
Job Performance Aid

CHECKLIST FOR PRESENTATION SKILLS

Answer "yes" or "no" to all questions.

___ 1. Did you prepare an introduction which includes a statement of the purpose of your presentation?

___ 2. Does the introduction orient learners to the subject matter of your presentation?

___ 3. Have you chosen a presentation format or instructional strategy appropriate for your learners' education, experience, and level of comprehension?

___ 4. Is the type of presentation (lecture, demonstration, role play, etc.) right for the size of your group and the subject matter?

___ 5. Are you comfortable with this kind of presentation? Whether formal or informal, does it fit your natural delivery style?

___ 6. Is the nature and amount of your material suited to learners' levels of education, experience, and comprehension?

___ 7. Is the material relevant to learners?

___ 8. During your presentation, do you ascertain whether learners are listening to and understanding your message? To make your determination, do you note verbal and nonverbal (gestures, facial expressions, etc.) cues from learners?

___ 9. Are these cues also useful in determining the length, focus, pace, activities, and illustrations of the presentation?

___ 10. During the presentation, do you provide visual or verbal illustrations of the main points?

___ 11. When you use analogies, do you select them to illustrate or clarify a particular point? Do you select analogies to compare known and unknown variables or two similar entities? Do your analogies fit logically into the context of your presentation? Are they well matched to learners' levels of comprehension and experience?

____ 12. If you establish frames of reference during the presentation, do they relate directly to a point you are making? Are they instrumental in relating the subject matter to the learners? Are they well matched to learners' levels of comprehension and experience?

____ 13. At the end of the presentation, do you provide summaries of key points?

____ 14. Do you apply feedback from learners to evaluate the presentation?

____ 15. Do you speak clearly and loudly enough for the group to hear everything you say? Is your tone of voice relaxed and natural? Are your mannerisms and expressions engaging rather than distracting? Do you maintain eye contact with your learners?

____ 16. Are you enthusiastic about the subject of your presentation and do you project this excitement? Do you also communicate the credibility of your subject?

____ 17. Do you show learners that you respect their background and previous experience?

Note. Adapted from How to Create a Good Learning Environment by M. Callahan (Ed.), INFO-LINE, Number 506, 1985, Alexandria, Virginia: American Society for Training and Development.

Human Resource Development Department
Survey of Human Resource Development

The University of Tennessee
Final Exam (post-test)

NAME: ____________________ S.S.# ____________________

Directions: Each of the following items contains four (4) alternatives, one of which provides the **best answer**. Circle the letter which precedes the best answer.

1. A result of America's change from an agrarian to an industrial economy was

   A. reduced interest in training programs because of high unemployment.
   B. the substitution of apprenticeship for most other types of training.
   C. a de-emphasis on agricultural training.
   D. the establishment of vocational education in schools to augment apprentice training.

2. History shows that the greatest stimulus to the growth of training in the United States has been

   A. wartime skilled workforce needs.
   B. the prosperity of the 1920's.
   C. the decreasing influence of the profit motive.
   D. skilled worker supply/demand imbalances.

3. The program to train shipyard workers during World War I was based on the principle of

   A. show, tell, do and check.
   B. classroom training separated from the worksite.
   C. traditional apprenticeship training.
   D. avoiding the use of work supervisors as trainers.

4. It is important to determine whether time spent in training is compensable time under federal legislation because

   A. participants in some training programs would have to be paid overtime and training costs would be higher.
   B. salaried employees taking part in training would have to be paid overtime.
   C. training can not be conducted during regular work hours.
   D. all participants in training would have to be paid overtime.

5. Which of the following would most likely qualify as true apprenticeship training eligible for U.S. government guidance and assistance?

   A. A one-year work/study program to train clerk-typists.
   B. An on-the-job sales training program with no classroom instruction.
   C. A 5-year program combining classroom instruction and on-the-job experience to train electricians.
   D. A work experience training program for 14- to 16-year-old migrants to learn harvesting techniques.

6. The Equal Employment Opportunity Commission's guidelines for selecting employees

   A. prohibit the use of selection tests.
   B. view all pencil-and-paper tests as being fairer than other selection methods.
   C. do not provide guidance in the use of employment selection tests.
   D. allow the use of valid selection tests

7. Financial benefits are typically easiest to measure in programs to train

   A. instructors.
   B. first-line supervisors.
   C. production skills.
   D. management practices.

8. A recommended procedure for achieving cost-effective training is to

   A. concentrate on training costs since benefits cannot be measured in financial terms.
   B. determine the absolute minimum training needs and deliver low-cost programs to meet these.
   C. always use the lowest-cost training method available.
   D. design and estimate costs for an optimum program and compare alternatives with this.

9. The package presented by the training department to support its operating and capital budgets usually should include

   A. training needs, programs, costs, and benefits.
   B. information on scheduling and participant costs.
   C. no mention of objectives other than financial ones.
   D. substantial excess costs to allow for cutting.

10. What is the advantage of charging the costs of a training program back to the using department or organization?

   A. The training department gains control of some of the operating department's funds.
   B. It automatically establishes the financial benefits of the training program.
   C. It substantially reduces the total cost of training to the overall organization.
   D. It reduces the training department budget by transferring some costs to the users.

11. The Hawthorne studies from 1927-32 found that

   A. higher wages are the best incentive for increased productivity.
   B. physical and environmental influences have little effect on worker efficiency.
   C. social interactions and group influences may have a stronger effect on work efficiency than physical factors in the environment.
   D. experimental methods are of little value in improving work effectiveness.

12. Who is regarded as the "father of scientific management"?

A. Elton Mayo
B. W. Edwards Deming
C. Frederick Taylor
D. Samuel Gompers

13. One argument in favor of Douglas McGregor's Theory Y philosophy is that

A. Theory Y allows a range of management approaches; Theory X permits only one.
B. employees will always seek responsibility.
C. achieving security is the main motivation of employees.
D. subordinates will always use self-direction in meeting organizational goals.

14. Maslow's hierarchy of human needs predict that a worker whose physiological, safety, social, and ego needs were satisfied would be motivated by

A. salary increases.
B. chances to satisfy self-fulfillment needs.
C. chances to satisfy belonging and acceptance needs.
D. fear of punishment or loss of reward.

15. Managers can conclude that a formal training program will be useful when

A. specific skills are required for successful job performance.
B. problems exist that can be solved by giving personnel identifiable items of knowledge, skill, or attitude.
C. individuals' performance does not meet job standards.
D. the organization is not meeting goals included in annual or long-term plans.

16. When originally organizing training efforts, the first task is to

A. decide on the internal organization of the training department.
B. survey the training that competitors use.
C. recruit staff for the training department.
D. study the organization to determine training needs.

17. To perform the evaluation function successfully,

A. a comprehensive evaluation must be conducted.
B. operating plans must be as long term as possible.
C. courses and programs must have performance objectives.
D. training activities and staff must be organized by function.

18. The most important function of a training policy is to

A. describe training programs to be carried out.
B. enumerate the problems that led to the establishment of a training program.
C. show how training will help achieve organizational (workplace) goals.
D. convince top management that training is necessary.

19. When an organization selects internal candidates to join the training staff, managers should

A. invest the resources needed for new trainers to develop essential job skills.
B. choose those who need no further training to perform their new duties.
C. make sure first that no qualified people are available from outside the organization.
D. select only those who are subject matter experts with long experience.

20. The first step in filling a training position is to

A. publicize the vacancy.
B. contact professional organizations.
C. specify the job requirements.
D. inform employment agencies of the opening.

21. When a candidate selected for a training position is deficient in knowledge, skills, or other selection criteria, the best thing for the training manager to do is

A. redefine the job specifications.
B. change the selection criteria for future positions.
C. invest in the necessary training and development.
D. reduce the job performance requirements.

22. Training and development needs result from

A. future responsibilities requiring new skills.
B. organizational goals of helping employees achieve their potential.
C. current human performance not being what is required by organizational objectives.
D. all of the above.

23. A customer survey may be carried out when investigating training needs because

A. performance problems may exist that are unknown within the organization but that frustrate customers.
B. customers are more aware of the overall effectiveness of operations than those within the organization.
C. most training and development needs can be identified in this way.
D. customer complaints are important.

24. A good policy when conducting needs surveys is to

A. concentrate on concrete responses and avoid eliciting attitudes, motives, and other subjective responses.
B. survey three levels: the target group, their supervisors, and their subordinates.
C. concentrate only on the target group in order to increase objectivity.
D. carefully avoid placing constraints on how the survey results will be used before the survey is carried out.

25. Organizational audits reveal training needs by

A. using surveys of perceived training needs.
B. exposing performance deficiencies that show up in records of the results of operations.
C. eliciting opinions concerning future training needs from a panel of informed managers within the organization.
D. establishing a system of assessment methods that do not rely on existing records.

26. A goal of the economic aspects of a performance audit is to

A. decide whether economic benefits justify efforts to improve specific performances.
B. substitute human behavior measures for economic measures.
C. reduce the extent to which training is based on economic factors.
D. provide accurate estimates of training costs.

27. When a manufacturer had a product quality problem, studies showed that machine operators were not able to make needed adjustments nor were they aware of quality- control results. Using the performance model, managers would probably conclude that

A. a training program would be sufficient to solve the problem.
B. employees needed training, quality-control results, and knowledge of concern about quality.
C. quality standards would have to be changed.
D. the problem could be solved most easily by replacing the workers.

28. Improving employee job performance is most likely to have a beneficial result when

A. the contributions of different types and levels of employees cannot be determined.
B. both the best and worst performers are very good.
C. the best performer is currently much better than the worst performer.
D. the best performer and the worst performer are currently nearly equal in performance.

29. An organization's plans for the development and use of human resources should

A. increase productivity and profitability by concentrating on needs for specific skills and abilities.
B. avoid the loss of efficiency resulting from attempts to interrelate individual and organizational goals.
C. develop goals which combine meeting the organization's needs with efforts to promote individual growth.
D. define individual growth goals only in terms of organizational needs.

30. The most important requirements for bringing about planned and systematic organizational change are

A. numerous personal conflicts within the organization to justify change.
B. the recognition of felt needs and the support of influential people.
C emotional equality and fairness currently existing in the organization.
D. budgets and personnel exclusively devoted to change.

31. The Johari window, when used in career planning, rests on the assumption that

A. organizational goals and individual goals are ultimately incompatible.
B. manpower planning is a more important function than career planning.
C. open two-way communication enhances interpersonal relationships.
D. communication of information between the organization and individuals is the least important aspect of career planning.

32. Job posting

A. is not recommended in organizations with formal career planning programs.
B is usually desired by management but resisted by employees.
C. is an effective way to give employees control of their career planning.
D. gives the organization full control over who will succeed to each position.

33. The most effective training programs are based on

A. job-relevant behaviors.
B. general principles of work effectiveness.
C. behaviors that are not specific to a particular job.
D. a content analysis.

34. In the early analysis of a proposed instructional program, the most critical step is

A. establishing the body of information trainees will be required to learn.
B. developing a task list of the behaviors desired.
C. deciding on the methods and techniques to be used by instructors.
D. assessing the training potential of proposed trainees.

35. When it has been decided to measure the trainees' level before they enter a training program, the goal should be to

A. sample the entire range of aptitudes that apply to the trainees' positions.
B. measure the extent to which trainees already possess the knowledge and skills to be trained.
C. develop a measure that will accurately predict the instructional criteria.
D. obtain an objective measure of potential ability.

36. A behavioral objective is a

A. description of the overall goals of a training system.
B. test used at the beginning and end of instruction to measure improvement.
C. description of the desired behavioral action, performance conditions, and standards of attainment.
D. description of the behaviors required of instructors to put the instructional system into practice.

37. Who has the primary responsibility for determining what changes in job performance should occur?

A. Trainer
B. Trainees
C. Line organization
D. External training resource

38. The best way for a trainer to deal with the identification of training needs is to

A. periodically circulate check-off lists of courses available.
B. choose educationally sound courses and locate problem areas in the organization they will help solve.
C. systematically and continually collect data to help identify problem areas.
D. wait for line managers to initiate training requests because these requests reflect true problem areas.

39. Tailoring programs from external resources to specific local needs is easiest

A. when training needs and course objectives are defined behaviorally.
B. for traditional courses in which objectives are not specifically defined.
C. with prepackaged media presentations.
D. for computer-aided instruction.

40. In deciding on class size for programs provided by external resources,

A. it is often necessary to compromise between the small class size desired by line managers and the large classes desired by the external resource.
B. facilities and equipment should not be allowed to limit class size.
C. classes should be as large as physically possible so all trainees can be accommodated in the fewest sessions.
D. it is often necessary to compromise between the large class size desired by line managers and the small classes desired by the external resource.

Human Resource Development Department
Survey of Human Resource Development

The University of Tennessee
Final Exam

Name: ____________________ SSN: ____________________

Directions: Select any four (4) of the following nine (9) items and answer them completely and concisely. Submit your answers along with this sheet at the end of the class session.

1. Describe and provide an example of the following:
   A. Formal education
   B. Nonformal training
   C. Informal learning

2. Explain what a Needs Assessment is and describe what purposes it serves.

3. The most important result of performance-based training is said to be a measurable improvement in an individual's contribution to **workplace/organizational goals**. List four typical workplace goals and briefly indicate how they justify investing private resources in training.

4. Just prior to WWI, Frederick Taylor introduced scientific management as a way to reduce costs. Demonstrate your depth of knowledge by describing, in a concise way, what Taylor meant by the phrase scientific management.

5. Identify five alternative interventions that should be considered before prescribing training provide a concise justification for each.

6. Research found that instructional text followed by post-text questioning resulted in performance as effective as programmed instruction. Within the context of the information sheet — **Research on Preparing Self-Instructional Materials**, react to this finding.

7. **Privately-funded** training is appropriate when there is a deficiency in knowledge and skills. This can happen when (a) new workers are hired, (b) new equipment is purchased, (c) new jobs are created, (d) jobs are to be performed in new ways, or (e) jobs are being performed in deficient ways by incumbent workers. **Publicly-funded** training is appropriate when what situations exist?

8. Based on your study of textbook chapter 1, **Determining the Market Demand for Skilled Workers**, and the module, **Determining the Demand for Skilled Workers**, identify and describe concisely the salient characteristics of any two (2) of the five labor market signaling approaches. Include a word table showing their advantages and disadvantages.

9. The practice of grouping students together in a classroom took hold during the Industrial Revolution. While **group instruction made mass education and training economically and administratively feasible**, it was at the expense of the individualized tailoring of instruction provided by one instructor working with one student. **Individualized systems of instruction can be viewed as attempts to recapture the effectiveness of individual tutoring without the expense**. Identify and describe two approaches to individualized instruction that proved successful.

APPENDIX A

Course Pre-test Answers

Item no.'s and answers	
1.	D
2.	A
3.	B
4.	B
5.	B
6.	C
7.	B
8.	C

Item no.'s and answers	
9.	C
10.	D
11.	A
12.	D
13.	D
14.	B
15.	B
16.	D

APPENDIX B

Progress Test Answers

Progress test no.'s	Item no.'s and answers			
1	1. D	2. A	3. C	4. D
2	1. B	2. C	3. A	4. B
3	1. D	2. B	3. A	4. C
4	1. C	2. D	3. A	4. C
5	1. D	2. A	3. D	4. B
6	1. D	2. A	3. B	4. A
7	1. B	2. A	3. D	4. B
8	1. A	2. B	3. C	4. C
9	1. B	2. D	3. C	4. D
10	1. B	2. C	3. A	4. D
11	1. C	2. C	3. D	

APPENDIX C

Course Final Exam (Post-test) Answers

Item no.'s and answers	
1.	D
2.	A
3.	A
4.	A
5.	C
6.	D
7.	C
8.	D
9.	A
10.	D
11.	C
12.	D
13.	A
14.	B
15.	B
16.	D
17.	C
18.	C
19.	B
20.	C

Item no.'s and answers	
21.	C
22.	D
23.	A
24.	B
25.	B
26.	A
27.	B
28.	C
29.	C
30.	B
31.	C
32.	C
33.	A
34.	B
35.	B
36.	C
37.	C
38.	C
39.	A
40.	D